The ENVIRONMENTAL DIMENSION in DEVELOPMENT PLANNING

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Economic Commission for Latin America and the Caribbean
(ECLAC)
Latin American and Caribbean Institute for Economic and Social Planning (ILPES)
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(UNEP)

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FOREWORD

From January 1, 1983 to December 31, 1985, the Economic Commission for Latin America and the Caribbean (ECLAC), with the collaboration of the Latin American and Caribbean Institute for Social and Economic Planning (ILPES), completed a project entitled "Incorporation of the environmental dimensions in the development planning processes: methodological issues, case studies and horizontal co-operation".

The project originated from an agreement between ECLAC and the United Nations Environment Programme (UNEP).

The project was carried out through the efforts of an ECLAC/UNEP Joint Unit on Development and Environment.

The project was implemented from the initial hypothesis that regional planning is the most favourable way to incorporate environmental dimensions in development planning. On the basis of this hypothesis five case studies were set up covering ecosystems, jurisdictional area of public bodies, and the basins and areas of influence of two major water developments. These case studies facilitated analysis of the institutional, legal and planning contexts of the cases themselves.

Likewise, the project commissioned conceptual studies aimed at exploring the issues of the crisis situation and its influence on the incorporation of the environmental dimension in planning, organization of public institutions, legal problems, environmental protection measures, the preparation of inventories and balance-sheets of the natural and cultural heritage, and the criteria for Latin American co-operation in this matter.

These studies are presented in this book, together with three contributions: two from UNEP's Regional Office for Latin America and the Caribbean (ORPALC), and one from the Food and Agriculture Organization of the United Nations (FAO).

The findings of the Regional Seminar on the Environmental Dimension in Development Planning, regarded as the culmination of the project are included at the end of volume I.

Volume II contains the five case studies chosen.

PART ONE

CONTEXT OF THE CRISIS

ENVIRONMENT, CRISIS AND DEVELOPMENT PLANNING*

by Osvaldo Sunkel**

There are two main reasons why ECLAC has attached great importance to the issue of the interrelationships between development and environment. The first is that the destructive effects of development have, in turn, negative repercussions on development itself. The second is that an adequate consideration of natural resources and the environment in development strategies, plans and policies constitutes a rich source of opportunities for improved social and economic development, while mitigating the effects of the crisis.

With reference to the first reason, the examples are numerous and well known. They include such spectacular catastrophes as those of Bhopal, Cubatão, Mexico City and others which captured the media headlines at the time. But there are others, less striking and much deeper and serious, such as the degradation of natural resources and soils –by deforestation, desertification, erosion, salination and other harmful processes– which contribute to unemployment, poverty, loss of productivity, and rural emigration, and aggravate the serious problems typical of underdevelopment.

Both in rural and in urban zones the environmental problems particularly affect the poorest sectors, aggravating their precarious situation and the social injustices. The exhaustion of certain high-quality non-renewable resources and the deterioration of renewable sources limit the chances of future development or, at best, entail higher costs because of the need to offset the decline in the natural productivity of these resources by means of supplementary artificial energy, which is generally imported. Furthermore, it is necessary to offset the negative effects of environmental degradation on health and standards of living by means of subsidies and expanded social services.

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Environmental damage and the degradation of natural resources also help to accentuate Latin America's traditional external imbalance since they weaken exports while strengthening imports through the growing need for energy, inputs and technology to compensate for the loss in productivity of resources. On top of this there is the insatiable demand for imports due to imitation of the life-styles of developed countries, which also determines production structures and technological systems and patterns.

However, it is not only on higher environmental costs and losses that most of the traditional conservationist and environmentalist literature focuses. The ecological approach also opens up a whole range of opportunities for better development based on an alternative and more rational development style and on more intelligent, equitable and sustainable exploitation of the environment. There are enormous possibilities of increasing the utilization potential of resources by means of structural and institutional reforms that can facilitate the access of vast social sectors to natural resources which have been misused or neglected. It is possible to create and develop "new" resources by means of the transformation of the environment into productive resources through scientific and technological research on the potential offered by adequate management of environmental resources. Natural resources are not static geographical data. They are created by society, provided that it decides and knows how to find and use them.

Biased by our dependent and imitative development, we have not been very imaginative, either in avoiding waste or in making best use of our own resources. Our scientific and technological development has not given priority either to the protection of environmental resources or to their adequate management. Neither has it paid attention to the identification of unnoticed or neglected resources, nor to improving efficiency in the use of raw materials or energy, nor to their conservation, and even less to the use of wastes and residues, all offering important potential contributions to development.

Another contribution that the study of the environmental dimension may offer for development is the integrated utilization of resources created by sectoral activities, especially in the case of major projects. The sectoral specialization of the public administration, the professions and credit and planning institutions has generated parallel activities that are unaware of each other, with great waste of opportunities for support and complementarity in the use of the multiple positive external economies created by these activities and big projects.

Our approach, therefore, aims at striking a balance between the positive and negative aspects of development-environment interaction. Traditionally, the environmental issue merely stressed problems of pollution, erosion, deforestation and degradation of ecosystems. Not that these problems are unimportant or even serious, but in this paper we have wanted to stress explicitly the fact that wise management of the environment also permits us to

obtain a serious of positive, interconnected benefits. For example, when we protect forests we not only ensure the supply of wood and timber and preserve wild flora and fauna, but we also prevent soil loss, lengthen the useful life of enterprises, reduce the risk of floods and retain carbon that would otherwise increase the carbon in the atmosphere.

This is not all. We would not be following in the intellectual tradition of ECLAC if we did not also stress the vital international aspect of the environmental issue. In this way we have also tried to emphasize the interrelationship between the national environmental systems and the transnational systems of trade, finance, investment and communications, which are coming increasingly into conflict owing to the economic crisis and the overwhelming foreign debt, both of which exacerbate the divergences of needs, interests and power between countries and groups.

Although we have assigned a leading causal role to the characteristics of development style, there is in our approach one topic that cannot be avoided: population growth. Nonetheless, we do not accept the neo-Malthusian ideology that prevails overwhelmingly in this matter, particularly in the North. It is not that we give less importance to the problem of demographic pressure and growth, which is undeniable, but rather that we believe it is possible to treat population growth as an independent variable affecting environmental problems. We believe in fact that improvement in the living conditions of the poorer sectors is essential if population growth is to move towards stabilization. In other words, the demographic process is a variable dependent of economic and sociocultural conditions.

This does not imply disregard of local points of excessive demographic pressure, usually increased by institutional conditions that limit access to the land and cause migratory flows toward urban or settlement areas and rural marginalization. This is one of the reasons why we have investigated rural economies in the Andean human settlements of Bolivia, Ecuador and Peru: water, land and energy constraints create demographic pressure there, making it particularly critical to ensure extremely careful ecological management permitting economic productivity and reasonable living standards, as well as the reproduction and subsistence of these settlements.

Expansion of agricultural and livestock frontiers in wet tropical areas has been another concern, partly for the same reason. It is often stated that Latin America possesses an abundant endowment of natural resources. With the exception of Central America and the Caribbean this is undoubtedly true, especially when compared to other overpopulated areas of the world. But a large part of our agricultural and livestock reserves are to be found in tropical arid or semi-arid areas, which implies severe environmental constraints. A fundamental conclusion of our studies of this topic is that the technological model applied to frontier agricultural and livestock activity imitates the model of areas of consolidated agriculture, leading to the loss of a large part of the existing agricultural and livestock potential and hindering permanent

settlement by the immigrant population, which embarks on an intermittent migratory cycle of high human and ecological cost.

Another issue which stems in part from that same concern is urbanization and, more specifically, the very serious problem of big-city growth. We have taken particular interest in the interrelations between the demographic concentration processes and economic, social and cultural activities, especially in connection with the role played by industrialization. We have also been deeply concerned with the importance of these processes from the viewpoint of utilization and speculation in relation to urban and suburban expansion, supply of raw materials and energy from the hinterland and outerland, its transformation into goods and services –as well as gaseous, liquid and solid wastes and residues– and the socially differentiated influence of all this on the living standards and productivity of the inhabitants of big cities.

The foregoing account provides concrete illustration of the nature of the environment-development dialectic. This has not been adequately formulated from the viewpoint either of environment or of development. The development viewpoint has proceeded as if the destruction and exhaustion of natural resources did not have present and future costs, and the environment viewpoint has not acknowledged the inevitable transformation of nature. The crucial issue is that the action of development involves an ecological transformation with present and future costs and that the absolute conservation of natural resources and ecosystems also implies present and future costs in terms of the potential goods and services obtainable from them. And since the beneficiaries and the losers are from different social sectors and generations, their respective interests inevitably come into conflict. Society requires mechanisms, procedures and criteria that offer a logical solution to such conflicts.

Since in this area the market fails in its function of allotting resources (a fact amply recognized in conventional economic literature), conflicts of interest and decisions are inevitably political in character. Hence the need for a political and administrative system capable of making a complete, well informed and appropriate appraisal, with a view to negotiations and compromises between the sectors concerned, in order to secure a careful balance between current and future costs and social benefits and produce, on the one hand, long-term development policies that take ecological issues into account –as far as reasonable– and, on the other, environmental policies that respect –in an equally reasonable manner– the requirements of socioeconomic and cultural development.

In short, society must accept that the development process implies the transformation of the natural environment into an artificial environment whose functioning requires continual and growing acquisition and extraction of raw materials and energy from the natural environment. This transformation produces socially desirable goods and services that improve

living standards in some respects but can at the same time cause deterioration and depletion of environmental wealth and natural resources, with a negative impact on other aspects of the quality of life, productivity and conservation, usually with regressive social effects.

In order to lessen the conflict and reduce the costs, negative effects can be minimized and positive effects maximized. This requires the creative adoption of alternatives of technology, location, scale, forms of organization, and production and consumption patterns, and progressive policies in matters of income, employment and access to productive resources, which will limit, lessen and diminish the pressure on natural resources and the environment. It is not therefore a matter of opposing development, industrialization, urbanization and modernization, but rather of changing their modalities and content, their style, and their relationship with their material, environmental and support base.

Furthermore, the stock of natural resources has a dynamic potential whose acknowledgement and utilization depend on better scientific knowledge, greater technological creativity and swifter and more equitable access. What is needed therefore is full incorporation of an institutional system of environment and resource management in the development strategies and activities, in order to minimize the deterioration and exhaustion of environmental assets and replace, maintain, expand and complement resources through the accumulation of scientific knowledge and reproductive capital. In this way the global natural and man-made environmental assets will grow cumulatively and become an increasingly broad and diversified support base for even higher standards of living, production and productivity.

Analysis of the reciprocal dialectical relationship between development and environment has finally led us to a conceptual position from which are derived the fundamental elements of an environmentally sustainable development strategy.

This outline of a viable development strategy does not, however, include the necessary analysis of the basic socioeconomic, political and cultural forces that drive development forward and therefore condition the way in which development interacts with environment. These forces are fundamental because they stimulate the dynamics of consumption and technology, affect demographic mobility and occupation of space, help to determine the location, size and concentration of investments and the international linkages among all these factors, and stimulate action on the part of the State and other social actors.

The success of policies designed to attain more harmonious environmental management which respects ecological laws does not depend merely on the will to apply the policies and their corresponding norms, but on the much harder task of guiding these social and political forces so that they operate with different standards from the prevailing ones. It is therefore not

just a question of adopting voluntarist attitudes in order to persuade individuals, entrepreneurs and public officials to respect the environment. It is certainly necessary to create this type of awareness; but little would be accomplished by this unless it is possible to modify the criteria underlying the thinking of entrepreneurs and public officials, the value systems, the economic and social structures, the orientation of technology, the institutional organization and the legal regulations. This is not impossible, as history demonstrates. However, it is a much more difficult and long-term task, because what has to be changed has its roots in the very operating rules of contemporary society, especially capitalist society, above all in its underdeveloped and peripheral version.

But his society is not static. Despite their relative stability and permanence, the social, power, value and technological structures have their own, somewhat troubled, dynamics nowadays. Generational structures and relations are changing, there are strong migratory flows and new relationships between couples and families. Values, forms of behaviour, tastes and habits are changing, strongly influenced by the transnationalization of the mass media and the generalization of education. The high rates of unemployment, particularly among the young, the population concentration and growing insecurity in the towns, particularly with the presence of neglected popular masses and their emerging and multiple claims, the decline of long-established ideologies, and the challenging and rejection of the bureaucratization and dehumanization of social institutions have also helped to shake these structures.

The same thing is happening in the case of the widespread discrediting and rejection of military régimes and the brazen use of force and repression in national and international social relations. The same may be said of the substantial technological transformations under way and in place in the fields of communications, computing, robotics, electronics and genetic engineering, as well as with respect to environmental problems as such –global, regional and local– and the problems of availability of natural resources of all kinds, exacerbated by the energy crisis, the urban crisis, industrial disasters, pollution, deterioration of critical ecosystems, desertification, and other familiar processes.

All these and other long- and medium-term phenomena that need not be listed here have combined dramatically and overwhelmingly with the economic crisis that has been afflicting our countries for some years.

The imitative development policies adopted in recent decades and the excessive foreign indebtedness of the late 1970s created conditions of extreme dependence and vulnerability in our countries. The outbreak of the economic and financial crisis in 1982 demanded serious recessionary adjustments, made more severe by the joint action of the big international banks and the International Monetary Fund. Their adjustment programmes took the forms of strong monetary and financial restrictions and reduction of public

spending, which resulted in a fall in private-sector income and expenditure. The contraction particularly affected investments and, above all, construction. This in turn made unemployment, underemployment and marginality more acute and contributed to the fall in the real incomes and wages of all the people and especially those in the low-income groups. This has caused the suspension of payments for public services (water, sewerage, garbage collection, electricity, fuel, telephones), as well as delays in the payment of rents and mortgage loans. The payment of taxes and State and municipal rates is also long in arrears. All this aggravates the fiscal deficit, which in turn forces the reduction of public spending: an authentic recessionary vicious circle.

Despite a feeble recovery of the Latin American economies in 1984, the region is still sunk in its worst economic crisis since 1930. The per capita GDP in Latin America 1984 was similar to that already reached eight years before, in 1976. The rate of open urban unemployment grew sharply between 1979 and 1984 in all countries, on top of which there are new increases in unemployment, both urban and rural. Another phenomenon that strikes the urban population, especially the wage-earning, unemployed and marginal sectors, with particular force is inflation, which reached the level of hyperinflation in several countries and accelerated sharply in almost all the others.

As a consequence of all this, real wages have experienced a setback and are now at the level of one and a half decades ago. There has also been an appalling deterioration in food, health and housing conditions as a result of the phenomena mentioned above and the drastic reductions in investment and basic social spending.

The present economic crisis has been compared, in depth and extension, to the Great Depression of 1929-1932. But there is a basic difference. The Great Depression took place in primitive rural societies, whereas the present crisis is affecting relatively modern urban societies, characterized by a concentration of population in big cities and of economic and socio-political activity. There severe tensions and conflicts typical of the Latin American scene in recent years should therefore come as no surprise.

Despite the appalling economic, social and political cost of the crisis in almost all the Latin American countries, it seems as if there still is no full awareness of the dramatic present situation. In fact, there seems to persist some kind of mental inertia that still feeds on the exceptional period of economic growth of the 1950s and 1960s and the financial boom of the 1970s.

It is still believed that the crisis will soon be over and that we shall soon be back to the "normality" of yesteryear. But the real prospects do not correspond at all with these expectations. The deterioration of the conditions of long-term growth in the central economies and the international economy is such that it is unrealistic to expect in what is left of the century a return to the expansion rates of the post-war decades. The conditions of the

international economy with respect to trade, investment and finance are not promising either. And, above all, there is the enormous and still growing burden of foreign debt, the repayment of which severely jeopardizes even the possibility of minimal growth of our economies. Even the most optimistic projections only allow the restoration of the pre-crisis levels of economic activity by the end of the decade.

The debt crisis must be viewed in this context. And to emphasize its gravity even more it is worth bearing in mind that this crisis has been the culmination of several decades of exceptionally favourable economic growth, of a great abundance of internal and external, public and private financial resources and of major investment and spending, above all in urban areas and particularly in metropolitan areas. What hope is there for the future, when the problems of unemployment, poverty and inequality, particularly urban inequality, may become more serious, while public and private, internal and external resources will probably remain unchanged at approximately the present low levels, with no prospect of growth and still with the possibility of additional restrictions?

We can infer from this that the future situation will be characterized by less growth than in the past, minimal external financing, a sharp demand for exports expansion, an urgent need to substitute imports, a drastic initial reduction and small subsequent growth of consumption, a need to satisfy the basic needs of the popular sectors, and severe limitations on the expansion of public expenditure.

Consequently, the Latin American countries will be forced, now inevitably, to face the structural crisis of their development, which had already been felt by 1970, but which they were able to put off facing, thanks to the very special financial circumstances prevailing during the 1970s. This is the main reason, apart from the very serious social injustices and the severe political tensions, why the short-term adjustment policies will prove fruitless. They assume that once the adjustment is made, things can return to normal. This is a fallacy. The successive adjustments, especially in the new international conditions, will lead not to normality but to a new encounter with a long-standing structural crisis, aggravated by policies that attempted to dodge it for one and a half decades, and aggravated even more by the present recessionary policies.

In terms of the traumatic experiences of the recent past and the sombre prospects for the near future, the main issues for the region at this critical moment in history are the debt, the crisis, the appalling social cost of an unduly prolonged recessionary adjustment and the need to overcome all this by an expansionary adjustment that may also constitute a transition towards a kind of development which will consolidate democracy and prove sustainable in the medium and long term.

The environmental-ecological approach, with its stress on social, natural and man-made resources its medium- and long-term perspective and its

preference for sustainable development based, on the one hand, on an austere style with new proposal options with respect to resource demand and, on the other hand, on ecologically rational and integrated management of accumulated natural and social resources and assets, may offer here a conceptual and practical contribution of greatest interest.

For this, it is necessary to begin by differentiating between short-term flows and the resources, assets, stocks or inventories acquired and accumulated in the long term. Within the latter we can distinguish three categories:

– Socio-cultural resources (the population and its demographic characteristics, traditions and values, level of education, institutional organization, ideological beliefs and political systems and régimes);

– Natural resources (the land, its ecosystemic characteristics and its actual and potential supply of renewable and non-renewable natural resources); and

– Fixed capital resources (installed and accumulated productive capacity and infrastructure or man-made artificial environment).

Needless to say, these are nothing but extended versions of the classic factors of production: labour, land and capital.

Although this is basically a political-economy approach, it has the advantage of linking socio-cultural and political issues with spatial-environmental issues and with accumulated production capacity. Because of this it also acts as a bridge between the evolution of medium and long-term flows and annual flows. The latter have to do mainly with short-term macroeconomic balances, be they fiscal, monetary, external, employment or income, and their socio-political implications and determinants. For example, the serious negative external imbalance of inflows of earnings and outflows of foreign exchange places a severe limitation on imports and produces a considerable underutilization of the accrued potential with respect to the socio-cultural, natural and productive-capacity resources. This means that there is considerable mobilizable potential of real resources (cultural, organizational and material), although this mobilization is dependent on a minimum of imported raw materials.

This approach may also help to clarify the issue of the shift from a recessionary adjustment to an expansionary adjustment and to the transition development. A recessionary adjustment consists mainly in the manipulation of short-term economic policy instruments in order to restrict the global demand by trimming public expenditure, reducing investments, cutting incomes, restraining monetary growth and devaluing the currency, all with the purpose of reducing imports, but with serious effects on accumulation, production, wages, employment, and use of accumulated social resources. The expansionary adjustment, rather than stressing solely the restriction of demand and imports, should combine a selective policy for restricting demand with a selective policy for expanding supply, making the most of

these idle productive resources. The idea is to change the composition of both in order to achieve their reciprocal adjustment.

As a first stage the aim would be to use these idle and available socio-cultural, natural and capital productive potentials, and as a second stage –to be undertaken in the medium or longer term– to apply investment, institutional and socio-cultural policies designed to change the deep-rooted style of the dependent and polarized structure of these social natural and capital resources.

Whereas a restrictive demand policy relies on the market to impose selectivity –with the familiar regressionary effects, given the incomes and power structure– a combined policy of selective restriction of demand and selective expansion of supply would have to make ample use of State planning and intervention. This raises the whole issue of the State, its effectiveness and representativity, but it also provides the bases for a democratic political agreement, provided that the costs and benefits of the this selectivity are equitably distributed.

There is enough accumulation of knowledge, experience and proposals of a macroeconomic and socio-political nature, together with more detailed knowledge of the sectoral type and of specific programmes, to attempt the formulation of concrete proposals for an expansionary adjustment, with its battery of selective measures and programmes. These are social and production programmes –both urban and rural– for the large-, medium- and small-scale enterprise, for informal activities which stress the alleviation of poverty, provide employment, generate exports, substitute imports and satisfy basic needs, and for the corresponding macroeconomic programme with its selective demand components with respect to taxation and public spending, lending, subsidies and suitable policies for the whole vast public sector.

The following of these measures are worth noting: labour-intensive employment programmes for housing, sanitation works, infrastructure and installation of communal facilities in densely populated settlements, construction and maintenance of road infrastructure, public works and human settlements in general, defence against floods and other natural disasters, reforestation, building of terraces in erosion-prone areas, cleaning and protection of rivers and canals, drainage and irrigation works, incorporation of new land, and repair and maintenance of public buildings, machinery and equipment, as well as other productive activities. It may likewise be possible to envisage policies to stimulate savings and substitute fuels and other high-cost inputs.

In addition, it may be possible to consider the alternatives advocated by various groups, which have different approaches with respect to integrated production systems, combined technologies, ecological development, etc., centered on production aimed at the satisfaction of basic needs through the utilization of knowledge, labour, natural resources, and wastes and residues, in combination with other techniques.

These activities lend themselves to the large-scale and low-cost use and organization of labour, and it is for this reason, as we have seen, that they are resorted to in the present situation. However, at the same time they imply a criticism of the prevailing development style in that they place greater value on working to satisfy basic needs and making more vigorous use of the work force and other underused potentials, with reduced use of scarce items such as capital and foreign exchange.

Furthermore, because of the multiple links of these activities with specific geographical factors, with daily experience and local knowledge and culture, as well as with ecosystemic relations, long-term prospects and the demands of scientific and technological development, they may become the bearers of a new growth style and a more vigorous and open cultural identity.

These possibilities are not susceptible of automatic realization: there is, instead, a tendency to adopt this type of measure strictly, on an emergency basis. It is therefore vital to use this period of crisis that began in 1982 to identify and promote these activities and, above all, to foster such conditions as may produce a more permanent and widespread reorientation of the labour process and make these multiple links more visible and appreciated.

In most cases these are activities related to collective consumption or production infrastructure which do not generally appeal to the private sector, either because they are investments with only long-term profitability since they favour the sectors of low income and limited effective demand, or because they involve the creation of external economies or avoidance of external diseconomies that the private investor is not capable of achieving. In other words, these are works and activities that normally fall within the sphere of responsibilities of the public sector.

Another principal characteristic of these works, activities and projects is their local geographical specificity. The issues both of unemployment and of conservation, protection and improvement of the environment make no sense when considered in abstract terms but only when related to concrete situations and places. This is therefore a public activity area that is particularly suitable for decentralization and community participation, issues of particular interest and priority in the search for democratic planning and decision systems. Although crisis conditions may trigger a movement of this kind, the fact that these are systematically unsatisfied basic necessities points to the need to use these ideas to create suitably institutionalized and financed permanent programmes and activities.

One priority area for adjustment and reorientation, which was mentioned above, must be consumption and investment patterns and technological guidelines. It will be necessary to impose severe and selective restrictions, except in very justified cases, on any type of demand that may directly or indirectly entail a large imports component or on any technology or design which affects that component, and to promote the substitution of imports with

goods, services, technologies and designs that rely on the use of national and local material and human resources.

All these suggested guidelines will mean greater pressure on the environment. The expansion, conservation, care and protection of environmental resources is therefore a fundamental contribution to higher living standards and productivity. This necessarily involves a greater knowledge of the environmental potential, of the ecosystemic factors that condition exploitation and of the most efficient management techniques, in order to make the most of the opportunities while preventing the deterioration and depletion of the environment and preserving its long-term sustainability.

All this suggests the need for giving priority attention in all future development strategies to the issues of natural resources and technology, considered from a long-term ecological perspective in order to incorporate fully the issue of the material sustainment of development. The criteria to be used will have to stress the central objectives of raising the standards of living of the lower-income strata and overcoming the severe external imbalance and dependence.

The emphasis on the exploitation of the region's own resources implies a greater differentiation than in the past between the Latin American countries and within each individual country. It means that development strategies should descend from their exaggerated level of abstraction to concrete consideration of the availability of natural resources and technology, the size and location of the country, the relationship between population and resources, the energy situation, and the degree and characteristics of urbanization. This means that the new development strategies will have to be different for the countries that show marked differences in these respects. It also means that when these strategies are applied in any given country they will have to give priority to the consideration of regional and spatial factors (including the urban-rural issue), since each country is a unique heterogeneous mosaic of environmental determinants. (For example, the Andean, tropical, island, coastal and other ecosystems that form part of the different countries offer resources with very dissimilar potentials and types of exploitation and they therefore call for different technologies with varying degrees of knowledge and applicability.)

The international crisis has once again revived the issue of regional integration and co-operation. The exploitation of the great potential resources of Latin America –by means of suitable environmental management in view of the risks involved in the use of resources whose ecosystemic behaviour is not well known– should be a most important means of reviving regional co-operation. The joint utilization, co-ordinated and sustainable in the long term, of areas such as the River Plate Basin, the Amazon Basin, the Caribbean, the maritime and coastal zones of the Pacific and the Atlantic, and Patagonia constitutes an enormous potential in terms of

agriculture and livestock, forestry, energy, mining and river and maritime transport.

This stress on the use of local resources presents great opportunities but also great risks. This is why the environmental dimension must be incorporated in development strategies and planning. This means encouraging the awareness and operational capabilities of planners, their technical instruments and the institutional organization of planning at all levels and in all aspects, so that natural and man-made resources and their ecosystemic characteristics are viewed as limited resources of optimal use, susceptible of expansion, renewal, deterioration and exhaustion depending on how they are handled, and interrelated with each other and with human activities in multiple and complex ways.

The planning methodology generally adopted in Latin America has paid little attention to the considerations listed above, mainly due to the fact that, like the development strategies themselves, it has been strongly influenced by a style based fundamentally on imitation of the development patterns of the industrialized countries.

The institutions and groups responsible for the environment and environmental action should therefore secure an influential presence in the process of conception, generation, design, evaluation and implementation of development plans, programmes, projects and policies. One of the lines of strategic priority for future environmental action should be the participation of environmental institutions and specialists in planning and development policies, in keeping with the institutional characteristics of each country. To attain this objective it will probably be necessary to bring about institutional and legal changes. It would therefore be advisable to adapt existing environmental institutions so that they can attain this type of objective.

For environmental action to be possible, it is essential for the environment to be taken into consideration in all the centres that develop and adopt decisions. This will not be possible if the environmental perspective is relegated to the periphery, excluded from the main decision-making centres which make the crucial development decisions, which are, inevitably, the priority ones.

Another stumbling-block for co-ordination is the fact that economic policy belongs in the sphere of economists and administrators, in the ministries of finance and the economy and in the central banks, whereas environmental planning and management tend to be handled by planning ministries and sectoral offices and autonomous State bodies responsible for energy, natural resources, public works, regional and urban development, education, and science and technology. This problem requires essentially a solution of the institutional type.

One final comment on the distinction between short-term and long-term policies, which is of great importance for tackling recession and the structural crisis: long-term policies, i.e., those that affect conservation of the

environment and natural resources, population, education, science and technology, international relations or forms of social organization, appear to bear no relation to short-term problems. However, as we have tried to point out, they are full of opportunities for contributing to the solution of some of these problems, such as job creation, development of new exports and possibilities for imports substitution. Conversely, the *ad hoc* policies formulated as a reaction against recession can be designed to preserve and improve social structures and resources and natural resources in the long term, instead of increasing their wastage and deterioration.

PART TWO

PLANNING, ORGANIZATION OF PUBLIC INSTITUTIONS AND JURIDICAL DIMENSION

I

THE ENVIRONMENT IN LATIN AMERICAN PLANNING: WAYS TO GREATER INCORPORATION*

by Nicolo Gligo**

INTRODUCTION

The environmental dimension has always been incorporated implicitly in development planning, given that any alteration of nature is environmental management. Old irrigation works, sewage systems, reservoirs, the polderization of marine areas and their consequent transformation into agricultural land were planned to modify nature in an appropriate way, which in itself constitutes positive environmental management. Consequently, all decision options for actions to transform the environment include environmental considerations, even though the environment is not mentioned.

But the concern to incorporate the environmental dimension more effectively in planning stems from the negative manifestations of some environmental problems, and also from the necessity of knowing and evaluating the environmental costs of development strategies. The roots of the problem must be sought in the constraints of the biophysical medium that sustains man and in the values, priorities and methods established by society to utilize the environment (García H. and García D., 1980).

To posit an explicit planning process presupposes, in the first place, the conviction that the necessity exists to alter the rhythm of development, to accelerate or to check it, or to modify its tendencies; but it also supposes that the strategies established by the planning process are really viable. And here, possibly, lies the problem of the incorporation of the environmental dimension in planning. The conviction exists, demonstrated by diagnoses of

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the environmental situation, that this incorporation is necessary but when the corresponding strategies are formulated, they are not normally compatible with the objectives and aims of short-term growth, because they must propose unquestionably, significant modifications of predominant production methods, of means of generation and appropriation of the surplus, of distribution of incomes, etc. It is therefore interesting to explore some potentially effective means of obtaining sound and sustainable long-term environmental development.

For this, it is necessary to revise relevant and basic aspects of the relationship between planning and environment and then to explore some ways of applying specific strategies and policies which, being situated neither at the macroeconomic nor at the microeconomic level, have caused difficulties and problems when put into effect.

A. THE ENVIRONMENTAL DIMENSION IN PLANNING APPROACHED FROM DIFFERENT CONCEPTIONS OF THE RELATIONSHIP BETWEEN DEVELOPMENT AND ENVIRONMENT

The incorporation of the environmental dimension into global planning systems has been extensively dealt with, primarily on the basis of existing conceptions of the relationship between development and environment. In recent years a large number of studies have attempted to analyse and interpret this relationship. Many researchers state that the concern about the ecology issue is quite recent and stems from the environmental crisis that the region is undergoing (Mansilla, 1981). But this issue has existed since antiquity. It is more likely that the ruling sectors and the decision-making centres have picked up the prevailing concern because they themselves feel threatened. It is undeniable that the discussion centred on demographic growth and availability of natural resources has stirred up more attention than the gradual deterioration of nature and even the problems of environmental pollution. The political crisis that this problem implies generated a large number of studies throughout the world and particularly in Latin America (ECLAC, 1974; Fucaraccio and others, 1973; Meadows and others, 1972; Chaplin, 1972). It may well be that many of these studies resulting from evidence of the effects in other parts of the world may have facilitated the perception of the environmental issue in the region.

The lack of response and the limited or non-existent treatment of the problem of the environment by classical and neo-classical economic theories prompted some people in the 1970s to question these theories and others to suggest some additions and modifications.

The aim of the studies was to raise objections, from an environmental viewpoint, to the maxims of the advantages of the market as organizer of an

efficient economy and also as a tool for identifying environmental problems (Friedman, 1976; Ruff, 1970).

These criticisms led to the following basic conclusions about efforts to incorporate the environmental dimension in planning:

i) The Pareto optimality proposed by the neo-classical school does not necessarily equate with the environmental optimum –a basic condition for understanding the reasoning of policy-makers in the use of resources (Georgescu-Roegen, 1975).

ii) Many of the irreversible environmental changes are not necessarily accompanied by the corresponding economic phenomena (Daly, 1977; Melnick, 1980).

iii) The possibility of solving environmental problems through bilateral negotiation (Coase theorem) is questioned (Coase, 1960; Mishan, Krutilla and Galbraith, 1980).

The problems of the classical and neo-classical theories mentioned above originated from the same current innovating trends of thought in an attempt to make up for their shortcomings. Some authors suggested that systems of ownership determine the use of resources and are therefore the basic cause of environmental problems (Melnick, 1980).

Marxist theory, although not explicitly acknowledging the importance of environmental problems, since it centres its analyses on the social and political considerations of economies, has the merit of differentiating carefully between means of production and therefore points to the analysis of the rationale underlying the different resource-use systems derived from different production and social relations. Moreover, its elaborate planning systems may more easily provide options for the incorporation of the environmental dimension. Despite all this, the various styles within the socialist system raise a series of questions about the different solutions adopted for the problems of environmental management (Sunkel, 1981).

Together with the critical appraisal of the economic theories and the positions taken by economists *vis-à-vis* the challenges posed, some integrative or holistic approaches have appeared which try to interpret development prospects in an integrated way, while at the same time giving priority to the consideration of the planet as an ecosystem and pointing out the physical constraints that may affect the development process. An instance of this is the report to the Club of Rome prepared by the Massachusetts Institute of Technology (Meadows and others, 1972; Mesarovic and Pestel, 1975) which was an important contribution to the debate on planning world development with zero population growth and reduced economic growth. The Latin American response to this position was the Latin American World Model of the Fundación Bariloche that points out the need for redistributive strategies directed preferably to the satisfaction of basic needs rather than to the setting of physical limits (Herrera and others, 1971). In addition to these works there

is a series of studies derived from neo-Malthusian positions (Brown, 1972; Wards and Dubos, 1972).

Global approaches centred on the controversial limitations to growth were dealt with from an energy viewpoint, defining flows and transformations in terms of energy and presenting unidimensional analyses of energy balances (Odum, 1971; Kneese and others, 1970).

Other analyses explore the causes of environmental problems, relating them to technology, social organization and economic structures (Sunkel, 1981). These analyses generated the differentiated interpretations applicable to developed and underdeveloped countries (Commoner, 1976). The Founex report prepared for the United Nations Conference on the Human Environment introduces the concept of human environment. This concept is developed further to associate it clearly with development strategies (Gallopin, 1980).

In Latin America the efforts to incorporate the environmental dimension in development have been complemented by the introduction of the concept of development styles, the performance of which determines the varying states of the environment (Sunkel and Gligo, 1980; Sunkel, 1981; Gligo, 1981).

All these theories, positions, interpretations and studies lead to certain conclusions that should contribute to a greater degree of coherence between planning systems and the environmental dimension. Their use as a framework of reference may permit planners to avoid the long road of apprenticeship that would have to be covered if they did not have this bank of studies. The main conclusions are:

i) The market is not an adequate mechanism for perceiving the environmental aspects of development or, at best, if there is perception it suffers from limitations and clear time-lags. In the original neo-classical model the environment is a typical example of externality and is therefore considered as such.

ii) It is impossible to place physical, ecological, political, social or economic laws on the same hierarchic level. It is easy to understand that socio-political science cannot alter fundamental physical laws. However, the situation is not quite as clear in the case of complex ecological laws. It is important to determine what these laws are and how they work, in order to understand their status with respect to the socio-political laws.

iii) The new resource and space requirements need not have an automatic technological answer. Society is sometimes unable to find technological solutions for many of the problems confronting it. For this reason, no "optimistic" forecasts should be made based on the myth of man's capacity to react, lest we run the risk of irreversible catastrophes.

iv) Latin American countries must approach their environmental management with different priorities from those of developed countries. These priorities must be taken into account in the adoption of technologies, so that development may be consistent with global development objectives.

v) Ecosystems have a limited sustainable capacity which, if exceeded, may cause their deterioration. Development expands towards the limits of this sustainable capacity. This concept is of interest as a variable in the interpretation of economic and social development, above all with regard to the time it takes to reach or exceed such a limit. This fact highlights the importance of long-term planning for the environment.

vi) Sustainable capacity is not a rigid concept related exclusively to the limits of the supply of resources or, in other words, to the physical environment. Socio-cultural capacity permits the modification of this sustainable capacity. For this reason, environmental management understood as the intelligent interaction of physical environmental supply and socio-cultural capacity would facilitate the positive transformation of nature and, consequently, the modification of the sustainable capacity.

vii) There is a marked time-lag between the economic horizons of producers and the ecological horizons of the environment. This is particularly relevant for the analysis of the different rationales applied by the different types of producer

B. THE ENVIRONMENT AT THE DIFFERENT LEVELS OF DEVELOPMENT PLANNING

The immediate challenges of economic growth have hindered the effective incorporation of the environmental dimension in development planning in Latin America. Despite awareness of the conflicts generated, it is necessary to analyse the basic concepts of planning and then consider how planning is approached in Latin America.

The degree of planning at a given moment can be defined by the existence and relative weight of a series of elements typifying both a planning system and a planning process (ILPES, 1981). This presupposes, in addition to an agent (either an individual or a group of individuals), the existence of an agency or institutional system and a formal procedure, a clearly defined subject of planning, a project for change, and a system of priorities and resource allocation different from the one operating in the market.

This is the main problem the experts must sort out when trying to incorporate the environmental dimension.

In the first place, it frequently happens in Latin American planning that the planning subject is not very clearly identified because of incomplete knowledge of the structures and processes involved in it. Ignorance of the behaviour and characteristics of the region's ecosystems is combined with gaps in the real knowledge of the social and economic structures.

In the second place, many planning systems, given the weak decision-making power and/or influence of the planning agents, set up objectives that are the mere prolongation of the established trends. In other

words, there is no explicit statement of a target-image which would mean changing the inertia of development. This poses a crucial problem: when the incorporation of the environmental dimension clashes with the prevailing trend, the usual reaction is to follow the trend. The planning agents considered here are part of formal institutional planning. This is not the case for other planning agents operating in other sectors such as economic ministries, development corporations, etc.

In the third place, given the problems posed by the subject of planning and the objective, it is logical to assume that the system of priorities and resource allocation will not be clearly defined either.

In general terms, all the countries of the region have the aforesaid problems, and each tries to find its own answers when taking the environmental dimension into account.

1. Environment and regional planning

The preceding chapter demonstrates the importance of the relationship between environment and regional planning. Regional planning seems to be one of the main available alternatives for achieving a greater degree of incorporation of the environmental dimension in development planning. As Boisier puts it, "The development of a region, as a phenomenon distinct from mere growth, implies a region's capacity to internalize its own growth. In purely economic jargon this is equivalent to retaining and reinvesting a significant proportion of the surplus generated by economic growth in the region itself" (Boisier, 1981). It is in connection with this problem that the incorporation of the environmental dimension may become an all-important means of making sectoral planning perform its allocation, compensation and reactivation functions in an effective way.

One first problem the region must master is the real and full knowledge of its own environment. It is generally the case in Latin America that the evaluation of natural resources is performed primarily by centralized bodies, either specialized or sectoral.[1]

It is these bodies that handle the information that may be transferred to other centralized bodies. This fact has not, to date, been assigned due importance. The limited information handled by the regions themselves, particularly with respect to their resource potential, can be a contributory factor in preventing certain exogenous variables that affect growth from becoming endogenous. It is therefore the centre that decides when and how

[1] Among the specialized bodies we could list, for example, the Chilean Institute for the Survey of National Resources, the Venezuelan Ministry of Renewable Natural Resources and the Environment, and Peru's Ntional Office for Natural Resource Evaluation. Among the sectoral ones, the institutes or ministerial units for water, land, forestry, mining, energy, etc.

to use the "natural resources", and the only option open to the region is to negotiate the investment priorities with respect to other regions.

The lack of complete information on the possibilities and constraints of the region's natural resources hinders the thorough evaluation of the regional impact of some of the most significant macroeconomic and sectoral policies. If the impact is negative, a very common situation in the case of the environment, lack of information may be an impediment in negotiations with the centre. For example, when big plans for the exploitation of forestry areas are issued from the centre, the region would be in a better negotiating position if it had a thorough knowledge of the behaviour and characteristics of the ecosystems affected.

But where the environmental issue may really contribute to the allocation and compensation functions of the regional planners is in terms of the size and type of programmes and projects for the exploitation of natural resources. The size of programmes and projects has to do with the possibility of reconciling national programmes and projects with regional ones. The advantages derived from the economies of scale associated with the adoption of imported technologies generate a tendency to undertake large investments or macroprojects which are centrally designed and managed. The fact that they are considered "national" reduces the region's negotiation options. Furthermore, and this is a crucial issue, the choice of a national project eliminates the option of a larger number of "regional projects" which would give the region a better negotiating status. The latter type of project generally assigns a higher priority to local considerations and, because of this, the human environment is more likely to improve.

On the other hand, the type of project for the utilization of natural resources which is tailored to their size has a marked influence on the chances of attracting surpluses and on the region's economic recovery. The region may stand a better chance of attracting resources by holding on to the physical production generated by the projects. For example, a large hydroelectric plant can easily deliver its physical production through its incorporation in interconnected energy systems. If the region has no negotiating power, then growth in terms of generated product will have no correlation with local development. But an investment that assigns priority to irrigation will obviously permit the local utilization of production. Although it is possible to divert the water to other regions by means of long canals, it is more likely that the utilization of the production will be regional. This does not mean that there will be no indirect appropriation of surpluses, via marketing structures, etc., –a problem which presents itself in any type of investment.

It may be said that the retention of physical production is one of the few courses of action open to the regional agents in order to secure, if not an advantage, then at least a reasonably equitable repartition between what remains in the region and what goes to the centre.

There is no complete agreement in this respect. Haddad says that it is precisely the national projects that facilitate negotiation (Haddad, 1980). In any case, opposing points of view open up the possibility of ample debate.

2. The environment and sectoral planning

Ever since the origins of planning in Latin America the environmental dimension has been in fact incorporated to a greater or lesser extent in planning in such traditional sectors as agriculture, mining, health, housing, etc. However, there is a tendency to create a new sector dedicated to the environment to deal with environmental problems. There is no doubt that a solution of this type only tends to exclude the environmental dimension from development planning in the medium and long term. The main arguments against promoting an "environment sector" approach are as follows:

i) Since environment is a dimension that cuts horizontally across other sectors, an "environment sector" would have no internal coherence and would produce a set of disconnected problems.

ii) Given the negative environmental tendency of the development style prevailing in Latin America, the environment sector would take on a merely control function, in many cases opposed to the implementation of projects affecting the environment. For planners in other sectors it would become a brake on development.

iii) If economic and planning decisions were entrusted to *ad hoc* agencies and ministries, these sectoral environment bodies would not have bigger resources, and this would deepen the conflict mentioned above.

iv) Except in very special situations, this type of body tends to become marginal. Thus the environmental dimension is relegated to second or third place and not incorporated in global and sectoral planning.

However, we must not confuse the institutional problem with the actual incorporation of the environmental dimension, it has been noted in Latin America that countries with *ad hoc* bodies and/or clear institutional assignment of explicit environment policies overutilize and degrade natural resources. The institutional issue must be in each case an instrument for the effective implementtion of strategies and policies that have incorporated the environmental dimension or that are specifically of an environmental nature (Echechuri and others, 1981). No general conclusion can be drawn in this respect. It is useful to add, though, that the reasons against "environment sectorization" might be similar in the case of the creation of a ministry for the environment. Nevertheless, each country must choose its own particular solutions.

The fact of not favouring an "environment sector" does not imply the rejection of environmental planning and, specifically, policies and lines of environmental action. Some studies tend to present a dichotomy between the positions advocating global incorporation of the environmental dimension in

planning and environmental planning. However, an analysis of the status of the environment in the region clearly shows the need for concerted action. On the one hand, it seems that full incorporation is far from being fully attained. This has created gaps that tend to be filled with environmental policies and lines of action involving traditional plans and sectoral agencies. On the other hand, the Latin American environmental situation is such that, apart from what can be done through suitable environmental action, it is indispensable to adopt a series of environmental measures because of the pressing need to solve the increasingly serious problems that arise. Needless, to say, many of these measures therefore emerge from *ad hoc* environmental policies.

And this leads to the analysis of the existing relationship between environment and traditional sectoral planning. The study of the situation in Latin America points to the conclusion that the incorporation of the environmental dimension in planning is effected in most cases through sectoral planning, either national or regional. It must be clear that the creation of autonomous environmental institutions to deal with policy implementation does not necessarily imply a breakaway from the sectoral approach, since the institutions may clearly reflect the functions of a given sector.

The sectors that have to deal directly with the exploitation of natural resources have in fact incorporated environmental action in their planning.

Planning of the agricultural or agricultural-forestry- livestock sector must take into account the performance and characteristics of the living ecosystem and its degree of alteration by man (or "artificialization"). This is possibly one of the sectors where any policy or line of action has repercussions on the treatment of resources and therefore affects the ecological costs of the transformation. However, when environmental planning of the environment sector is proposed in Latin America it is generally associated with the prevention of erosion and with the problem of soil and water pollution, mainly by pesticides. Since the problem is much more complex, it is necessary to point out the following facts:

i) The complexity of production methods prevailing in agriculture as a result of the resource-tenure structure and cultural, social and economic patterns;

ii) The introduction of technological models that favour the maximum artificialization of ecosystems, failing to take advantage of the environmental supply and making agricultural development dependent on the energy subsidies that artificialization requires;

iii) Specialized use of the ecosystem inconsistent with its natural aptitude, mainly as a result of action by powerful international and national purchasers;

iv) Social problems of rural poverty that in many cases encourage overuse of the environment;

v) Competitiveness in the use of the land by the food, energy and industrial sectors and also in connection with urban expansion;

vi) Marked discrepancy between short-term economic performance and the conservation of resources.

Among the sectors engaged in secondary activities, the industrial sector clearly has a real importance with respect to the relationship between planning and environment. On the one hand, it is closely connected with the demand for resources from primary sectors and, on the other hand, the generation of industrial wastes creates pollution problems which in turn result in a series of environmental policies for the prevention or solution of these problems.

In marine ecosystems the situation is similar to that in agriculture. The exploitation of the renewable natural resources of the sea has a high ecological cost, which is aggravated by the scanty knowledge of the behaviour of these ecosystems and, above all, by the difficulty of programming efficient control measures.

To all these problems must be added two aspects that are not easy to plan: the control of alterations produced by the dumping of man-made wastes into the sea and the pollution produced by oil spills and by the exploitation of other non-renewable resources from the sea bed. All this leads to the conclusion that the planning of the processes affecting the sea is so complex that it can only be achieved with great effort.[2]

The environmental issue is also of great importance in the social sectors: health, housing and basic services. It would be redundant to list yet again the familiar shortcomings, which are tending to become more serious, in all the social respects in Latin America. The traditional problems have been complicated in the last few years by the increased dimension of the pollution issue. In urban areas, and mainly in big cities, air and water pollution, besides chemical and organic contamination of food grown on the outskirts of the cities, have created permanent monitoring duties for public health agencies. In rural areas, the increased danger of human contamination by pesticides has resulted in the creation of special programmes to seek answers to this problem.

With regard to housing and basic services, the housing programmes have actually incorporated the environmental dimension. However, the urgent need for solutions has generally resulted in limited low-cost programmes carried out in unsuitable areas, which has resulted in less attention to the environmental potential.

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[2] Important steps are already being taken in the region. See, for example, Vergara and Pizarro, 1981. Also Vergara, 1980. For the situation of fisheries resources see Tapias, 1980.

3. The environmental dimension and urban planning

Extensive studies on the process of urban development have not always assigned due importance to the environmental issue. However, a global understanding of the problem, with a systemic approach and exhaustive research on migration, the social situation, spatial organization, sale of land, and transport, provides an adequate framework for the incorporation of the environmental dimension in the urban development policies (Unikel and Necochea, 1975; Kowarick, 1980; Geisse and Sabatini, 1980).

It is possibly in urban planning that sectoral and particularly social, policies that have to do with environment most often materialize. The relative size of the urban population *vis-à-vis* rural population has made it necessary to assign priority to the launching of many urban social plans and programmes, to the detriment of rural areas. The huge number of environmental problems arising from the processes of accelerated urbanization and, most particularly, the gravity of some of them in the big cities, has made urban planning an activity in which the environmental dimension has been incorporated to varying degrees.

It is important, however, to clarify some concepts. The city may be considered a highly artificialized urban system which must be constantly supplied with materials, energy and information, and from which the wastes generated by its activities must be removed. But it must not be forgotten that, although it is a highly artificialized system, the city originates from an ecosystem that, despite the transformations to which it is subjected, has preserved its basic characteristics and has a constant given environmental supply. Consequently, the high degree of artificialization should not conceal the possibilities for the use of the environmental potential still present in the ecosystem. On the other hand, the planning of urban development should take into account the point that some transformations have an irreversible effect on the environment.

Notwithstanding these arguments and those maintained by urban planners, the environmental dimension in Latin America has been incorporated in planning as a result of serious environmental problems that have become real bottlenecks in some cities, although medium-sized and small cities often implicitly incorporate the environmental dimension in their design and urban management.

The growing power of the local, municipal, metropolitan and other administrations in Latin America, as a result of the worsening of urban development problems, and in particular of the environmental problems, is demanding very sophisticated planning processes that are interrelated with regional and global sectoral planning. Consequently, it is increasingly important to analyse the ways in which the environmental dimension can be incorporated. The following considerations may prove useful (ECLAC, 1982c):

i) It is essential to acknowledge the need to take an integrated, historical and long-term approach to the urbanization process and to realize that human settlements should be considered as the nuclei for the concentration of population, activities and man-made environment, which generate and stem from a constant flow of transformations and use of materials and energy.

ii) Beyond the familiar problems of pollution, in the planning of spatial structuring special importance attaches to problems of the sale of land and the organization of transport systems.

iii) Transport policies have multiple impacts on urban environment and on the general demand for natural resources, energy resources in particular.

iv) Representation of the interests of the community has not been a widely used planning instrument. There are notable examples, handled independently of the formal planning channels, where local answers to environmental problems have been produced.

4. The environmental dimension in project evaluation and implementation

Taking the above considerations as a starting point, it is now necessary to examine the matter of project planning, since it represents the materialization of whatever policy, strategy or line of action the planner may advocate.

To a greater or lesser extent, analysis of environmental impact has become standard practice in projects, and the methodologies used have been improved to such an extent that they are now accepted without reservation (Domínguez, Rodríguez, Cordero, 1977; López de Sebestián, 1977).

Without going into the critical analysis of the underlying concepts of evaluation and without delving into the methodologies (since that is not the purpose of this book), it is necessary to emphasize two elements that are of fundamental importance in the planning-environment relationship. The first is the need to plan for "environmental management in the projects". It is quite usual to find that impact studies present only an assessment of the negative impact on the environment, ignoring the positive impact of artificialization or assigning less importance to it. The following quotation may be illuminating; it refers to environmental management at large hydrological works (ECLAC, 1982a): ... "Stress was placed on the advantage of undertaking an analysis of relations between environmental management and large hydrological works through study of the former in terms of development goals, i.e., answering the question of how best to manage the environment in order to attain sustained economic and social growth. Due account was taken of the fact that the material expression of environmental management for development purposes was, precisely, the execution of an important project for the exploitation of water resources". It would be encouraging to see this

position repeated in all the works involving some degree of alteration of nature by man.

It is not therefore a question of deciding between different project options on the basis of mere economic criteria and determining at a later stage, from among a more limited number of options, which is the most suitable ecological and environmental choice, but rather of formulating the environmental considerations from the outset. And this leads into the second subject to be dealt with: cost-benefit analysis.

The need to adopt a unidimensional variable for the assessment of a project's economic performance has led to the use of this instrument in relation to environmental problems as well. But, as José Leal states, "Nevertheless, despite its more or less generalized use, what has revealed cost-benefit analysis as a viable and useful support methodology are the deficiencies discovered in its implementation, which have generated wide controversy concerning the advantages of its use in this type of decision" (Leal, 1982).

But since the use of this instrument is widespread in Latin America, it should not be rejected outright but its limitations should be explained and a decision made as to when it can be a support instrument in decision-making. There appear to be three most serious limitations:

i) The impossibility of applying economic assessment when the survival of the species is involved.

ii) The complications arising from the long duration of environmental processes, which introduce a high degree of uncertainty.

iii) The notable difficulties of current environmental assessment owing basically to the elasticity of the concepts of resource, future or unknown resources, etc.

However, and despite its limitations, cost-benefit analysis can be a support instrument in deciding between options, especially since it introduces the necessary economic dimension into the assessment process, an important factor in a context of limited funds.

C. WAYS OF INCREASING THE INCORPORATION OF THE ENVIRONMENTAL DIMENSION IN SPECIFIC STRATEGIES AND POLICIES

The balance of the situation in Latin America with respect to the incorporation of the environmental dimension in planning is not positive. On the contrary, the environmental situation in many areas and different production processes is tending to deteriorate, a fact confirming that the countries' traditional planning systems, which are failing to introduce special measures, do not appear to be the most promising vehicle for fully incorporating the environmental issue. It is economic policies which have the

most frequent repercussions on the environment. However, in general terms these policies have a negative effect because they take only the short term into account.

Analysis of the different levels of planning reveals clear differences in the degree of incorporation and especially in the effectiveness achieved at each level. There is no doubt that, with every day that passes, more efforts are being made to secure incorporation at the macroplanning level. The inclusion of environment as a basic factor of development is widely acknowledged, and this has resulted in guidelines formulated in terms of purposes, objectives and global approaches.

At the other end of the scale, the microeconomic level also shows a rising trend with respect to the incorporation of the environmental dimension, particularly in the case of specific projects. The main problem here, apart from a certain lack of definition and gaps in methodology, lies in the political decisions to incorporate the environmental dimension both in management and in impact analysis.

However, the main problem lies in what could be termed "halfway planning" *(mesoplanificación)*, which accounts, on the one hand, for the fact that the macro-formulations do not materialize into anything concrete and, on the other, for the absence at the micro-level of specific policies and suitable frameworks, as well as for the lack of integration with the whole system.

For this reason, it is necessary to explore what ways can be found to secure increased incorporation of the environmental dimension in policies. Solutions should be formulated in terms of:

i) Sectoral approaches;
ii) Urban planning approaches;
iii) Regional approaches; and
iv) Approaches through relevant processes.

Increased incorporation in the traditional sectors (agriculture, mining, industry, health, education, etc.) will depend on the efforts made to encourage sectoral policy-makers to take environmental considerations into account. The degree of importance assigned to the environment will be determined by the development objectives and priorities of each economic sector. It frequently happens in the region that the planning of the different economic sectors is structured in terms of growth of the sector's product and income. Although other development objectives such as job-creation and, in some cases, elimination of poverty and satisfaction of basic needs are explicitly stated, it seems that the growth targets have priority over all others.

In sectors such as agriculture, pressure to increase growth is one reason for the inadequate attention paid to the environmental dimension. Two problems must be mentioned. The first is the effects on the ecosystemic resources, an issue that has not as yet been identified owing to the non-existence of resource balance-sheets. In agricultural activity, since what is at issue is the modification of the productivity and the type of production of

natural ecosystems, the ecological cost is high. This fact, however, is only realized in the long run. Moreover, when new land is incorporated in forestry, agriculture and livestock activities, what is "harvested" in most cases is part of the ecosystem, resulting in a reduction of the resource.

As for industrial planning in Latin America, it is quite common to find evidence of the remarkable efforts made to stimulate it. In the case of planning under the protected or State-intervention market system, the State tries to promote industrialization in different ways, mainly by making investments highly profitable. And here lies the main obstacle to the incorporation of the environmental dimension. The internalization of environmental costs is in open contradiction with the desired high profitability, a fact that causes many economists and planners to omit these concepts.

Furthermore, efforts to relocate industries should take into account a series of environmental considerations relating to the organization of space. They include the following: the population affected; the waster-absorption capacity of the affected ecosystem and mobility of its work force; the transport of inputs and products; and the conflict over the use of certain resources such as water, etc.

Policies generated in social sectors should explore the causes of social situations in order to promote the necessary measures for their solution. For example, it is quite common to find that the public health agencies of health ministries are responsible for the control of pollution levels, but the solution to the causes of this problem goes beyond the remit of these ministries.

Solutions which have been formulated through urban planning are based on the growing importance of urban problems and the growth rates of towns and metropolitan centres. Urban development policies, therefore, constitute integrative proposals in which a series of sectoral and spatial policies may converge. Although urban planning looks promising for the introduction of the environmental dimension, it seems to be more suitable to include this issue in urban-regional, or merely regional, planning. Given the magnitude of the problems and the population numbers involved, an exception could be made in the cases of metropolitan centres or regions warranting special treatment.

Solution by means of regional planning, as previously stated, appears to be an interesting and suitable way of incorporating the environmental dimension through retention of physical surpluses, as well as through environmental management that considers investments more in terms of regional dimensions and types.

It must be established whether the regional approach should operate through traditional areas or whether it is necessary to create specific areas determined by the importance of the environmental issue in them or by the scale of the environmental management already in place. There is no doubt that, if specific areas were created and given the necessary legal and political

instruments, it would be possible to achieve better incorporation of the environmental dimension.

Watershed planning meets this purpose, for it is based on possible environmental management through the control of water. However, past experience in watershed management has revealed a series of difficulties that must be considered. In the first place, the inflexibility of technical experts in determining strict physical limits has meant on many occasions that the integration of one sector of a basin with another was not considered, or that sectors of the same basin requiring separate treatment were treated as a unit, or that the analysis of potential inter-basin water flows was included, etc. In the second place, in many instances watershed planning has meant superimposing a new planning scheme on the existing one, with the consequent conflict. This has resulted in institutional difficulties due to the lack of co-ordination and struggles to settle the institutional power issue, rather than in complementary and integrated action.

Something similar occurs when areas are defined on the basis of a large infrastructure investment such as a hydroelectric dam, an irrigation works, or a farming area earmarked for intensive treatment.

Solution through the definition of relevant processes is an approach that will no doubt gain more supporters each day, as traditional planning fails to respond to the environmental problem. It is a matter of identifying processes that are bottlenecks, both because of their negative impact and because of the possibility of a creative and positive change.

These processes may have varying degrees of generality or specificity. For example, a general process may be the urban development of a marginal area and a more specific one the availability and organization of transport facilities for this area.

Similarly, there are countless processes that each country could determine in the light of its problems and potentials, establishing its own priorities. Some processes, however, are found in almost all countries of Latin America. The following are some of them: industrial location, industrial pollution, urban-regional land planning, management of cultural assets, management of national parks and similar areas, soil degradation in forestry, agricultural and livestock areas, expansion of marginal urban areas, rural development, development of irrigation and drainage areas, expansion of the agricultural and livestock "frontier", use of farmland for urban expansion, urban air pollution, mining pollution, pollution resulting from the transport of oil, management of hydrological works, management of forestry and grazing land, management of coastal marine wildlife, management of mangrove swamps, marine pollution by man-made wastes, food contamination by pesticides, wildlife management, etc.

If this planning approach is adopted in order to make the incorporation of the environmental dimension more efficient, it will be necessary to create special commissions with executive and co-ordinating authority and also with

the necessary resources. It seems unrealistic to propose the creation of special new agencies, save in exceptional cases, since the main need is not to create new functions but rather to revitalize functions already assigned to agencies and/or to co-ordinate these functions with others.

One of the dangers of this planning approach lies in establishing priorities exclusively in terms of the processes that produce environmental degradation, ignoring the importance of incorporating environment in the planning of a positive transformation of nature. In other words, it is not just a matter of checking the process of deterioration but of planning and managing nature.

ECLAC/UNEP studied four relevant processes in Latin America, with a view to recommending policies in which the environmental dimension could be suitably incorporated. The processes studied were: environmental management at major hydrological works; expansion of the agricultural-livestock frontier; metropolitan concentration; and peasant survival at high altitudes (ECLAC, 1982a; 1982b; 1982c, 1982d).

The following aspects are worth mentioning in light of the joint analysis of the four processes:

i) Agreement was reached on the need for an integrated, historical and long-term approach, wherein the different transformations of the environment could be analysed in relation to flows of materials, energy and information;

ii) The main factors that influence each process relate to economic decisions based on the need to increase production and/or the welfare of the population. Accordingly, the environmental dimension is considered provided that it does not conflict with these objectives in the short term;

iii) The prevailing development style in Latin America tends to put its stamp on each one of these processes. For example, environmental management must adapt to the dimensions of the hydrological works; the expansion of the agro-livestock frontier meets the need for production generated by controlled domestic demand and by the international market; metropolitan concentration encapsulates the polarization of social forces and the negative distribution of income and environment, and the problems of peasant survival basically derive from the exogenous technological model adopted in agriculture;

iv) The four processes have clear specific forms which permit their integration in regional planning. Environmental management at major hydrological works has as one of its main problems the delimitation of the area and spheres of influence;

v) The processes pose the need for the incorporation of the environmental dimension from the stage of plan and programme formulation, so that the policies produced take the environmental dimension into account from the start;

vi) It was demonstrated in the four processes that the solution of the more notorious and serious problems does not depend on their identification

or on the technical instruments, but rather on the possibility of removing certain obstacles in order to make the recommended policies viable.

Analysis of ways to achieve increased incorporation of the environmental dimension in specific policies shows that the most suitable processes seem to be the last two, even more so if they are combined. In other words, the idea would be to determine relevant processes and located them physically in specific regions or areas. There is no doubt that in this way specific policies will be able to harmonize the short term with the medium and long term.

This conclusion can be better appreciated in the following table:

Areas		Processes					
		P_1	P_2	P_3	P_4	P_5	P_m
a_1	Watershed	a_1P_1	a_1P_2	a_1P_3	-	-	a_1P_m
a_2	Irrigation zone	a_2P_1	-	-	-	-	-
a_3	Area of rural development	a_3P_1	a_3P_2	a_3P_3	a_3P_4	a_3P_5	a_3P_m
a_4	Area of influence of dam	-	-	-	-	-	-
a_5	Urban area	-	-	-	-	-	-
a_n	.....	a_nP_1	a_nP_2	a_nP_3	a^nP_4	a_nP_5	a_nP_m

Thus it will be possible to determine the *specific areas* where serveral of the *relevant processes* may be unfolding in a particularly intense way. These areas could be given special treatment.

On the other hand, once the relevant processes are determined, they may be studied in terms of the areas where they apper in a more marked form, for this would facilitate the regional, and above all the subregional, allocation of each process.

The experience of some Latin American countries may contribute valuable background information. For example, the determination of the process of air pollution in the specific area of a certain metropolis has helped to create and promote specific policies to be put into practice in that area.

Another example, this time of a positive transformation, would be the experience acquired in areas of integrated rural development. Some of them have been planned in the traditional way, but in others a more innovative approach has been taken, resulting in the environmental management of resources that will facilitate a sustained growth in the long term.

BIBLIOGRAPHY

Boisier, S. (1981), *Política económica, organización social y desarrollo regional*, Latin American and Caribbean Institute of Economic and Social Planning (ILPES) Training Programme (D/77), Santiago, Chile.

Brown, L. (1972), *World without borders*, New York, Vintage Books.

Chaplin, D. (ed.) (1972), *Population Policies and Growth in Latin America*, Lexington, Heath.

Coase, R. (1960), "The problem of social cost", *Journal of Law and Economics*, October. [For a summary discussion of this subject, see E. Mishan, J. Krutilla and J. Galbraith, quoted by S. Melnick in "Principal schools, tendencies and currents of opinion", in O. Sunkel and N. Gligo (eds.) *Estilos de desarrollo y medio ambiente en América Latina*, Lectura series, No. 36, Mexico City, Fondo de Cultura Económica, 1980, two volumes.]

Commoner, B. (1976), *The Poverty of Power*, New York, Alfred Knopf Inc.

Daly, H. (1977), *Steady State Economics*, San Francisco, California, W.H. Freeman and Co.

Domínguez, H., E. Rodríguez and L. Cordero (1977), *Tres casos de impacto ambiental: aeropuertos, embalses con central hidroeléctrica y vertedero de residuos sólidos*, Madrid, Centro Internacional de Formación de Ciencias Ambientales (CIFCA), Cuadernos del CIFCA series, No. 4.

Echechuri, H. J. M. Montes and others (1981), discussion paper presented at Seminario de Expertos sobre Planificación del Desarrollo y Medio Ambiente (Doc.Apoyo/9), Madrid, CIFCA, December.

ECLAC (Economic Commission for Latin America and the Caribbean) (1974), *Economic Bulletin for Latin America*, vol. XIX, Nos. 1 and 2.

_____, 1982a), *Report of the Regional Seminar on Environmental Management and Large Water Resource Projects* (E/CEPAL/L.262), Santiago, Chile, February.

_____, (1982b), *Report of the Regional Seminar on the Expansion of the Agricultural Frontier and the Environment in Latin America* (E/CEPAL/L.261), Santiago, Chile, March.

_____, (1982c), *Report of the Regional Seminar on Metropolization and Environment* (E/CEPAL/L.266), Santiago, Chile, April.

_____, (1982d), *Report of the Regional Seminar on Agrarian Policies and Peasant Survival in High Altitude Ecosystems* (E/CEPAL/L.273), Santiago, Chile, June.

Friedman, M. (1976), *Price Theory*, New York, McGraw Hill.

Fucaraccio, A. and others (1983), *Imperialismo y control de la polución*, Buenos Aires, Periferia.

Gallopin, G. (1980), "El medio ambiente humano", in O. Sunkel and N. Gligo (eds.), *Estilos de desarrollo y medio ambiente en América Latina*, Lectura Series, No. 36, Mexico City, Fondo de Cultura Económica.

García, H., A. and E. García (1980), "Las variables ambientales en la planificación del desarrollo", *ibid.*

Geisse, G. and F. Sabatini (1980), "Renta de la tierra, heterogeneidad urbana y medio ambient", *ibid.*

Georgescu-Roegen, N. (1975), "Energy and economic myths", *Ecologist*, vol. 15, No. 15.

Gligo, N. (1981), *Estilos de desarrollo, modernización y medio ambiente en la agricultura latinoamericana*, Estudios e Informes de la CEPAL series, No. 4 (E/CEPAL/G.1117), Santiago, Chile.

Haddad, P. (1980), *Participação, justicia social e planejamento*, Rio de Janeiro, Zahar Editores.

Herrera, A. and others (1977), *¿Catástrofe o nueva sociedad? Modelo mundial latinoamericano*, Bariloche Foundation/International Development Research Centre (IDRC), Bogotá.

ILPES (Latin American and Caribbean Institute of Economic and Social Planning) (1981), *El estado de la planificación en América Latina y el Caribe* (E/CEPAL/ILPES/R.16), presented at the III Conference of Ministers and Heads of Planning of Latin America and the Caribbean, 30 October.

Kneese, E. and others (1970), *Economics and the Environment: A Material Balance Approach*, Resources for the Future, London, Penguin Books.

Kowarick, L. (1980), "El precio del progreso: crecimiento económico, expoliación urbana y la cuestión del medio ambiente", in O. Sunkel and N. Gligo (eds.), *op. cit.*

Leal, J. (1982), *Análisis costo-beneficio de medidas de protección del ambiente*, ILPES Training Programme (CDA-31), Santiago, Chile.

López de Sebastián and Gómez de Agüero, J. (1977), *Evaluación económica del impacto ambiental*, Madrid, Cuadernos del CIFCA series, No. 3.

Meadows, A. and others (1972), *Limits to Growth*, Cambridge, Mass., MIT Press.

Meadows. D.H., D.L. Meadows and others (1972), *Los límites del crecimiento. Informe del Club de Roma sobre el predicamento de la humanidad*, Mexico City, Fondo de Cultura Económica.

Mansilla, M.C.F. (1981), *Metas de desarrollo y problemas ecológicos en América Latina*, Caracas, Cuadernos de la Sociedad Venezolana de Planificación series, Nos. 150-152, January.

Mesarovic, M. and E. Pestel (1975), *Estrategia de la sobrevivencia: crecimiento orgánico*, Mexico City, Fondo de Cultura Económica.

Odum, E. (1971), *Fundamentals of Ecology*, Philadelphia, Saunders and Co.

Ruff, L. (1970), "The economic common sense of pollution", *The Public Interest*, No.19.

Sunkel, O. (1981), *La dimensión ambiental en los estilos de desarrollo de América Latina* (E/CEPAL/G.1143), Santiago, Chile, July.

Tapias, C. (1980), "El medio oceánico y la actividad pesquera", in O. Sunkel and N. Gligo (eds.), *op. cit.*

Unikel, L. and A. Necochea (1975), "Desarrollo urbano y regional en América Latina", *El trimestre económico*, Lecturas series, No. 15, Mexico City, Fondo de Cultura Económica.

Vergara, I. (1980), "El problema de la contaminación marina producida por el transporte marítimo en América Latina", in O. Sunkel and N. Gligo (eds.), *op. cit.*

Vergara, I. and F. Pizarro (1981), "Control de derrames de petróleo", *IMCO Manual*, UNEP/Permanent Commission of the South Pacific, Santiago, Chile.

Ward, B. and R. Dubos (1972), *Only One Earth*, New York, W.W. Norton and Co.

II

INSTITUTIONAL ORGANIZATION OF THE STATE FOR INCORPORATING THE ENVIRONMENTAL DIMENSION IN DEVELOPMENT PLANNING

by Ricardo Koolen*

A. THE LATIN AMERICAN SITUATION

1. The development-environment issue in Latin America

Although it is true that the "environmental dimension has always been incorporated implicitly in development planning, given that any alteration of nature is environmental management" (Gligo, 1982), the fact is that only in the last 15 years has the issue of its explicit incorporation come under discussion and experiment.

Only in a few parts of the world, among them Latin America, has the environmental problem been so closely linked to development planning. There is a great profusion of studies and projects, research, teaching and training, and private initiatives and institutional experiments focussing on the environment-development equation. At times, it could be thought that the Stockholm Declaration on the Human Environment (1972), many of whose principles call for a solution of environmental problems through development planning, has settled dogmatically in Latin American ecological thought and has therefore strongly influenced it.

The Cocoyoc Declaration (1974) and the reaction to the report of the Club of Rome which later took shape in the Latin American World Model (1974) are, among others, important confirmations of the fact that the derivation was not dogmatic but was from the beginning a hypothesis based on studies of the actual political, economic and social conditions of the region. Perhaps this was influenced by the fact that starting in the 1970s the environment issue erupted in Latin America, not so much in traditional nature conservation circles, as is usual in developed countries, as in groups,

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above all intellectuals, who had long been concerned with the preservation of mankind and the problem of developing their people, especially the poorest.

Without doubt, these groups have been shaping a conceptually very valuable theory[1] about incorporating the environmental dimension in development planning.

There is almost unanimous agreement that the objectives of this incorporation are the following:

"a) To guarantee access to natural resources and their use to guarantee the present basic needs of all the population, particularly the poor majority;

b) To assure the suitable use and reproduction of those natural resources which sustain long-term development to guarantee the survival and welfare of future generations;

c) To redirect scientific and technological activity to realization of the potential and utilization of the biophysical environment, itself, and especially the use of renewable resources and the recycling of wastes. This is particularly important for energy;

d) To adopt an integrating, multidisciplinary perspective at the different levels of policy and development planning, particularly incorporating both natural science data and physical and spatial planning dimensions;

e) To consider seriously and systematically how the international scene influences the structure and functioning of society in all its dimensions, including the environmental; the ways in which connections with the dynamic centres which set styles are both limitations and opportunities which should be taken into account in the search for new styles;

f) To permanently seek ways of improving the participation and social organization of the poor and ways of decentralizing planning activities to compensate for the tendencies and structures which concentrate power prevailing in the economy and society;

g) To make a massive effort to re-educate the entire population to awaken and deepen a consciousness of the environment and the ecological aspects of development" (ECLAC/UNEP, 1983).

Many diverse efforts have been made in the region over the last decade to give concrete shape to these proposals, both in reviewing the objectives and methodologies of global, regional and sectoral development planning and of project design, implementation and evaluation and in improving the institutional apparatus and the State mechanisms needed to achieve these ends (Sunkel and Gligo, 1980; Sunkel, 1981; Sejenovich, 1981; Sejenovich and Sánchez, 1978; Echechuri and others, 1983; Gallopin, 1981).

[1] A good example of this conceptual value is all the concept of "development styles", which provides tools for analysis and means of action which significantly improve previous methodology, concentrated, almost exclusively, in studying the structural contradictions in the bosom of our societies and between them and the centre.

2. Evaluation of results

Although the magnitude of the task and its long-term time scale have always been appreciated, several diagnoses made in recent years show a more or less generalized awareness among those who have been active, in one way or another, in promoting the changes in question, that progress has been very slow and may even have stagnated to some degree in a situation where conceptual development of the idea of incorporating the environmental dimension in development planning, blocked in various directions, is being prevented from passing from the abstract world of ideas to the world of concrete political reality (Uribe, Echechuri, Montes and Koolen, 1981; Echechuri and others, 1983).

Rather than describing how the Latin American and Caribbean State structures and institutional mechanisms have been adapted to take up the environmental issue, which others have already done (Brañes, 1979; Valenzuela, 1981; Brañes, 1982; CIFCA, 1982), this study will try to formulate some hypotheses about the responsibility of the institutional forms which have been attempted for the insufficient progress and relative stagnation mentioned above, at the same time recognizing that perhaps some of these forms did not achieve the desired efficiency because of their intrinsic deficiencies, but mainly for extrinsic reasons related primarily to the meagre political support given to them.

A critical judgment of this kind, however, cannot be limited to the purely institutional aspects since there have been and are very strong and decisive conditioning factors in the overall historical, political and economic framework in which the development problem itself has evolved in the last 12 years in the region.

The first and most important of all, in our opinion, is that when the proposal to incorporate the environmental dimension in development planning made its appearance in Latin America, at the beginning of the 1970s, development planning itself had entered a profound crisis which was not sufficiently recognized at the time.

We believe that, on the premise that development planning structures and methodologies, notwithstanding criticisms which may be justified and improvements which could be made, in fact operated relatively well. All the theoretical elaboration and discussion and all the practical efforts were limited, with some unintentional ingenuousness but ingenuousness for all that, to the problem of how to incorporate the environmental dimension in "that" planning.

Only many years later, in 1979, did de Mattos' lucid work become known, in which he baldly displayed the secondary role that development planning has played in the process of change when he pointed out that:

a) Under present conditions in Latin America, long-term plans have proved universally ineffective; they have had little or no influence on what has actually happened;

b) The concept that planners are agents of social change guided by their own values and images of what development is (these values and images being, supposedly, those of the "national community") has also proved inapplicable;

c) Professional planners, prevented from acting effectively on the real world, have given a great deal of attention to methodologies for building technocratic utopias. Partly because of these methodologies (with their rigidity and disregard of the problem of political limitations) planners have not been able to make an effective contribution to achieving their own objectives, even in the few cases where these objectives were shared by the ruling State powers;

d) Meanwhile, the ruling powers make *de facto* "plans" according to their own view of how to reinforce their rule in the kind of society they wish to build, using technical advisers who may or may not be called "planners". This kind of planning can be applied practically without taking any account of parallelactivities of the official planning agencies or the publication of plans (de Mattos, 1979).

Following the same train of thought, Sejenovich and others pointed out, years later, that "practically all the (planning) offices created in the 1950s still exist, but many of them have very little, if anything at all, to do. The term 'development planning' continues to be widely used, although sometimes it only refers to piecemeal and adaptive policies. As a result, there has been a drastic decrease in expectations and confidence in economic and social planning" (Sejenovich, Maya and Gutman, 1983). Among other causes of this failure, these authors blame the inadequacies of traditional planning, in conception, methodology, implementation and monitoring, and the fact that economic and social development planning was regarded as a means of independent action standing above domestic and international, economic and social conflicts of interest.

This is not the place to try to demonstrate that, in spite of the serious crisis engulfing nearly all the Latin American economies, planning continues to be the only valid option for overcoming this crisis and launching autonomous and sustained development policies, even though it must be sufficiently creative to overcome the bad methodological, organizational and other habits which have led to the "technocratic ghetto" where it takes refuge. The incorporation of the environmental dimension, it should be said, brings with it problems and potential which, at all events, broaden development planning and put it on a more realistic plane.

At this point it must be concluded that, in principle, it cannot be expected that the incorporation of the environmental dimension in this planning would suffer a different fate from the planning itself and show different indexes of

practical sterility. ILPES points out that "the planning methodology which has been generally followed in Latin America has paid little attention to the above considerations, largely because, like the development strategies themselves, it has been strongly influenced by a style based primarily on imitation of the patterns of development of the industrialized countries" (ECLAC/ILPES, 1983).

In 1981 and 1982 the UNEP Regional Office for Latin America and the Caribbean made an interesting survey of planning and environment authorities in some Latin American and Caribbean countries; these are some of the conclusions, taken from the above-mentioned study by Sejenovich and others:

– For several years now, and increasingly, global development planning includes the environmental issue among its general objectives. The real effect of this approach, however, in influencing the orientation of plans and their main policies is judged to be generally very small.

– There has been more opportunity of incorporating environmental aspects in sectoral development programmes and large development projects. This has made it easier to undertake some environmental control measures, but there is little evidence that incorporating the environmental aspect has lead to great changes in the objectives and strategies of these projects.

In some countries restrictions on incorporating the environmental dimension in planning relate to the lack of development planning or its very weakness.

– In all cases there is a demand for operational methodologies for bringing about this integration and concern to widen and strengthen options and points of agreement between technical output and practical action.

On a similar point, the ECLAC/UNEP Joint Unit on Development and Environment indicates that "the balance-sheet of the situation of Latin America with regard to the incorporation of the environmental dimension in planning certainly does not show positive results. On the contrary, the environmental situation in many areas and various productive processes tends to be growing worse, meaning that the traditional planning system of the countries does not seem to be the most promising way to incorporate fully the problem of the environment" (ECLAC/UNEP, 1983).

In the light of these criticisms, and of others more or less in agreement which could be cited (Uribe, Echechuri, Montes and Koolen, 1981; Echechuri and others, 1983), it is obvious that development planning, on the one hand, and incorporation of the environmental dimension, on the other, are problems which have not yet been solved in Latin America and that this failure stems from very different causes related to the dependence of our countries on the subordinating force of the dominant development style, to the lack of a sufficiently strong political will and action for change, and to the technocratic illusions with which perhaps both problems have been approached to date.

3. Evaluation of the attempted institutional forms

In this complex jungle of causality it is difficult to tell what responsibility for the relative frustration of the ideals of 10 years ago falls on the institutional forms adopted for development planning and environmental management.

Some interesting reactions can be seen in development planning which, by restating planning modes and techniques, will, have to be reflected if the criticism prevails, in some way or another in the institutional planning models and mechanisms. This is so because, basically, all the new ideas in recent years about, for example, adopting negotiated, participative and adaptive planning modalities or proposals about situation planning, etc., recognize that the problem does not really lie in transferring the technical statements of planning offices to the realm of political decision or even to society as a whole, where the deficit has historically been more marked.

The nub of the question depends, rather, on ensuring the necessary interaction between planners and the whole of society, so that the former pick up the way society perceives its problems and aspirations, as well as the transformation modalities that appear to be most suited to society's idiosyncracies and present degree and form of political development; and, conversely, how to persuade society to accept the planning proposals. In so far as all this give and take between planning and society is mediated by the political structure of the State, this structure's degree of democracy and the institutional forms it may assume will be of crucial importance.

Furthermore, the institutional models for environmental management tried out in Latin America from 1972 on are also highly responsible for the technocratic isolation of this issue within the State itself, not only with respect to the incorporation of the environmental dimension in development planning, but also with respect to an effective provision and incorporation of ecological considerations in the flows, vertical (national State to regions, or provinces to municipalities) and horizontal (environmental sector, to other public administration sectors), of any State decision.

It is true that, having stated as the basic objective of environmental management its incorporation in development planning and since the latter is in a generalized state of political isolation and technocratic hibernation, the result was to some extent inevitable.

In our opinion, however, it is equally true that from the very beginning environmental "institutionalization" was approached with very little imagination or creativity and with orientations that were, on the whole, mere imitations of the forms adopted by the developed countries; this only confirms the fundamental way in which, in the fields of law and public administration sciences, the region has always shown a dependent juridical culture.

As pointed out at the outset, although Latin American thought in the vanguard in making the environment-development relationship the main issue and state repeatedly and unanimously that the holistic, intersectoral and

interdisciplinary approach was essential for environmental management, we were only able to create "sectoral" environmental agencies in the very image of the institutional models of certain central countries, whose suitability for them we do not even acknowledge. In any case, however, they approached the environmental issue from the perspective of "correcting" the model and style of development and not of "changing" it, as we have suggested in Latin America.

Brañes gives a very complete outline of the ways in which environmental functions are concentrated in specific areas of the administration, ranging from instances of a high degree of concentration, though no less "sectoralizing", as in the case of Venezuela, to others only relatively concentrated through allocating or placing environmental functions in pre-existing agriculture, mining, public works, health, urban planning or other agencies (Brañes, 1979). Only in Peru does the agency holding a coherent set of environmental responsibilities, the National Office for Natural Resource Evaluation (ONERN), report directly to the National Planning Institute. Even so, from the formal viewpoint, although its technical output may have shown a suitably holistic view and a growing tendency to internalize the society-nature relationship, its responsibility is restricted to natural resources.

We agree with Gligo (Gligo, 1982) in his criticism of the tendency of the region in the 1970s to create a new "administrative sector" for the environment. According to Gligo, "there is no doubt that a solution of this type will only tend to marginalize the environmental dimension from development planning in the medium and long term". This is because:

"1) Since environment is a dimension that cuts horizontally across other sectors, an 'environment sector' would have no internal coherence and would produce a set of disconnected problems;

2) Given the negative environmental tendency of the development style prevailing in Latin America, the environmental sector would take on a merely control function, in many cases opposed to the implementation of projects affecting the environment. For planners in other sectors, it would become a brake on development;

3) If economic and planning decisions were entrusted to *ad hoc* agencies and ministries, these sectoral environmental bodies would not have bigger resources, and this would deepen the conflict mentioned above;

4) Except in very special situations, this type of body tends to become marginal. Thus the environmental dimension is relegated to second or third place and not incorporated in global and sectoral planning."

This institutional situation, characteristic of the region, has no other explanation than bureaucratic, sectoralizing inertia in confronting the complex issues of each country and has typified the organization of the State since the Bourbons introduced departmentalized management in Europe. Although this departmentalization may be valid for such fields as public works, transport, energy, industry, foreign affairs, etc., it does not seem the

best way to approach the objective of an environmentally reasonable development policy. This is mainly because a policy of this kind implies redirecting the present society-nature relationship and demands that the whole of the State, in all its levels and sectors, works to this end. It is absurd to think that this joint operation can result from the action of one sector or part of the State, no matter how many forms of co-ordination are attempted.

In fact, conversely, recent experience has shown that the new environmental agencies of the region, apart from publicly disseminating the environmental theme, can show clear and definite results only in the area of global studies and diagnoses, particularly macroregional, of the environmental state of the countries and in determining the potential environmental impact of some large projects. However, as pointed out elsewhere (Uribe, Echechuri, Montes and Koolen, 1981; Koolen, 1984), there have been constant very serious difficulties, affecting all countries and generally insurmountable, in attaining the transfer of this technical output to the decision-making process, global or sectoral (or even specific, as in the case of the environmental evaluation of projects).

The time has come, therefore, to question whether it is advisable to persist in believing that environmental agencies are "good" and all others are "bad".

4. Ideas for institutional adaptation

To create institutions is to create a tool to do something. Today the countries have a much clearer and accurate idea than a decade ago of what they want to do. The information base has become much broader and the diagnoses of the state of the environment and its interrelationships with the specific development mode of each country have been considerably refined. Despite admitting, as above, cases where the kind of agency predominant in the region which sectoralizes environmental responsibilities has been useful, we must ask ourselves whether such agencies can do what we now know should be done.

A document prepared by the ECLAC/UNEP Joint Unit (ECLAC/UNEP, 1983) shows very clearly the fields of action and priorities that the incorporation of the environmental dimension in development planning now implies.

a) Those countries which practice global planning or "macroplanning" as the document calls it, no longer question this incorporation. In these countries the problem is to prevent "the environment" becoming just another chapter or remaining mere statement, a very real danger in global planning, as was said before.

b) At the other extreme, at the "micro" or specific project level, the environmental evaluation is also accepted, particularly in large projects, and

methodologies have been considerably developed. However, it appears to have had limited effect on the orientation and final shape of projects.

c) As the document quoted very rightly puts it, "the fundamental problem lies in what could be called *"mesoplanificación"* ("halfway" planning) which, on the one hand, prevents the macro-formulations from materializing and, on the other hand, results in the absence of specific lines and suitable frameworks in specific projects as well as a lack of articulation in the whole system" (ECLAC/UNEP, 1983).

Mesoplanificación is where the greatest efforts to incorporate the environmental dimension should be concentrated and it is made up of:

- sectoral planning: agriculture, mining, industry, health, education, technology, etc.;
- regional planning;
- human settlements planning;
- watershed management, and
- relevant processes (ECLAC/UNEP, 1983).[2]

The incorporation of the environmental dimension in all these areas of planning obviously needs, among other things, an appropriate organization of the State apparatus and of the means for administrative and political action.

In our opinion, such institutional organization, whose specific profile would depend on the concrete situation and even on the administrative traditions of each country, should combine the following basic characteristics:

a) A sufficient legal-normative base to offer, at all levels, the necessary support to the development planning system and to the incorporation of the environmental dimension in it;

b) Rigid and concentrated administration only for those environmental responsibilities which absolutely need it and more flexible and adaptive formulas for all the rest.

c) Reflecting regional expectations of increased democracy to move from a "paternalistic" and "technocratically infallible" State to a State capable of trying out formulas which increase public participation in the definition and attainment of objectives, both for development planning and for incorporation of the environmental dimension.

On the first point, Brañes says, "In Latin American countries, there is usually no formally established body of law for planning. The first problem in incorporating (the environmental dimension) is, therefore, the non-existence of a defined legal framework for planning where it can be clearly reflected" (Brañes, 1984). Obviously this refers to the planning procedures or operating arrangements resulting from these procedures, rather than to the formal institutionalization of planning, since the respective agencies always have

[2] Relevant processes refer to development processes where the environmental impact is emphasized both in its possible negative effects and in its possibilities for creative and positive change.

legal backing. Any planning model (Gligo, 1982), implies a degree of obligation and it is therefore necessary to incorporate the environmental dimension in the range of objectives and procedures enforceable by law. This applies to all levels, from global planning to evaluation of the environmental impact of projects.

The second point, the conclusion that rigid and concentrated administration should be adopted only where strictly necessary, has been derived from an analysis of the tendency to create environmental agencies in the region since the 1970s and from their achievements.

To think that it is possible to incorporate the environmental dimension efficiently in all the areas described above while maintaining sectoral environment agencies, either within the traditional public administration or even in a particular ministry, seems to us an error.

In our opinion, this "sectoralization" has proved to be an obstacle to influencing the development planning agencies which, on the whole, always show a strong tendency to "self-sufficiency" with respect to cross-sectoral objectives of an environmental type. For example, it is difficult to imagine a sectoral agency prescribing guidelines or criteria for spatial planning or land use to a global planning office. On the other hand, giving the responsibility to a sector has generated a strong tendency to emphasize environmental aspects in terms of the parent agency (for example, natural resources, health, urban development, etc.), diluting the holistic perspective and losing credibility and acceptance when this perspective has been used to attempt actually to influence the policies of other sectors of the administration or even of the parent agency itself. It is also difficult to imagine that an agency attached to, say, the health sector, would suggest criteria for managing natural resources to the agricultural or mining sector, or vice versa.

Above all, it must be kept in mind that incorporating the environmental dimension in the sectoral planning of other areas does not imply a specific type of task but, rather, a permanent means of collaboration or transfer of "environmental inputs" which the other sectors generally consider an unacceptable form of subordination.

These characteristics of "horizontal management" become much more serious in "vertical management" involving regional, provincial or municipal agencies.

Some countries like Brazil, Costa Rica, Cuba, Nicaragua and, to some extent, Panama have been attempting since 1981 to create national environment systems which in some way guarantee the political and operational priority of the technical output of environmental agencies over the rest of the State, from the national to the municipal level, throughout all the relevant sectors. Since these measures are still in the early stages, it is very difficult to pronounce on their advantages. However, we must say, *a priori*, that the disconnection of this system from the development planning system raises some doubts as to its possible efficacy.

In our opinion, this solution is only an effort to guarantee the "penetration" of the technical output of the sectorally conceived environment agencies in other areas or sectors of the administration through co-ordination mechanisms more typical of "institutional cultures" (developed countries) which are historically more used to reconciling economic, social and bureaucratic interests.

We believe that first it is necessary to identify clearly the State functions strictly related to incorporating the environmental dimension in the planning process and then proceed to an adequate and practical "restoration" of these functions to the State apparatus and decision-making mechanisms.

As was stated before, the possible and desirable areas of incorporation are a) global planning; b) sectoral planning; c) regional planning; d) human settlements planning; e) watershed management; f) relevant processes; and g) specific projects derived from all the above. It is obviously foolish to attempt to concentrate all these necessary areas and administrative responsibilities in a single institution, since this would take in practically the entire State. On the other hand, the institutional mechanisms must make sure that "environmental concerns" are correctly represented, no more and no less than this.

Seen in this light, it seems advisable to start from the simple practical tenet that whatever can and should be done from within the State agencies responsible for the above-mentioned areas by their own staff should be done by them and not by an environmental pseudo-agency which, by trying to assume responsibilities that are not inherent in it, generates such confusion and rejection that its real responsibilities end up not being even noticed or acknowledged.

Therefore, the conformation of an "environmental area" can only validly materialize through analysis of the administrative responsibilities necessary for incorporating the environmental dimension in development planning, followed by breaking down by responsibility the remaining responsibilities that cannot in any way be met, at least exclusively, by other State agencies.

We think that these functions are:

a) To make and periodically revise an inventory of natural resources;

b) To make and periodically revise a diagnosis of the state of the national and regional environments, in particular monitoring the form and intensity of the society-nature relationship;

c) To develop a decentralized national system for environment information with the necessary capacity to incorporate and reformulate with ecosystemic criteria, all the information originating in other public and private agencies;

d) To investigate specific environmental problems when, for various reasons, this is not done by other sectors;

e) To prepare environmental guidelines for planning global, regional, sectoral, human settlements, watershed management, relevant processes and specific projects;

f) To act as a real "State advisory service" giving technical advice to other State agencies of all kinds and levels for the incorporation of the environmental dimension in the areas mentioned in e) above, especially concerning evaluation of the environmental impact of projects.

g) To manage the national protected natural areas (national parks, reserves, etc.) in order to develop and capitalize on the stocks of scientific and operational knowledge for a permanent and smooth transfer of this knowledge to other State sectors and agencies, particularly to those responsible for the management of natural resources, as well as to the private sector.[3]

With the exception of this last responsibility, which implies an administration with national jurisdiction, none of the others involves responsibility for direct management of the environment but, rather, the production of "environmental inputs" to be used by others.

The smooth flow and channelling of these inputs implies a form of dependence on the central planning office but also a certain degree of autonomy, particularly necessary for managing the protected natural areas defined in g) and for the responsibility defined in e).

For all sectors and agencies (regional, national, etc.) the central office would provide a link with the National Planning System, without excluding direct agreements to give technical advice to any other agency.

However, adequate uptake capacity and management control at the other end of both the vertical and horizontal lines, require the creation of small environment units in the different agencies and sectors of the planning system, particularly at the level of regional planning offices and administration sectors, the management of which has a significant impact on the environment (public works, agriculture, industry, etc.). Since they have to be multidisciplinary, these units should have a certain degree of specialization according to the particular characteristics of the sector or region.

Finally, both for development planning and for incorporating the environmental dimension in all areas of planning, it is of crucial importance to identify the public's perception of the problems, its concrete expectations, responses, technological traditions, etc., as well as to guarantee stable forms of public participation in policy-making and project evaluation.

Although legal procedures established (for example, environmental action or participation by the people in evaluating the environmental impact

[3] The genetic diversity and wealth found in protected areas requires that they play a fundamental role in biogenetic and biotechnological development, bestowing significant future possibilities on countries with systems of this kind of area sufficiently representative of the various ecosystems of its territory.

of projects, particularly at the local level) or institutional procedures (such as advisory boards or councils) will depend on the legal system of each country, they seem more necessary than ever and their creation should not be delayed.

B. THE ARGENTINEAN CASE

1. Argentina's environmental problem

In order to formulate realistic and useful institutional proposals for the incorporation of the environmental dimension in Argentinean development planning, which is one of the objectives of this study, it is necessary to begin with a general description of its different environments. This will be followed by a brief description of its most important environmental problems.

The environments of Argentina[4]

From the standpoint of the natural environment, Argentina has a very large and diversified endowment of both renewable and non-renewable natural resources unevenly distributed over its territory, which has a wide range of rainfall patterns and climates, varying from subtropical to cold.

The distribution of both water and the best livestock and agricultural land is typical of the country: it is concentrated in a limited part of the territory. In fact, more than 80% of the country's surface water is concentrated in the Plate basin and only one-third of the territory, almost all in the pampas, contains the country's most abundantly fertile land, the remaining two thirds being semi-arid or arid.

Throughout its history Argentina's economic and social development has been very much influenced by this double concentration phenomenon. The settlement patterns, the geographical location of human activity, especially economic –not only livestock farming but industries and services–, the development of infrastructure, internal migration and immigration flows, the structure and dynamics of political and economic power, all show a high degree of concentration parallel to and symmetrical with the concentrations of nature: society has tended to concentrate in the places where nature concentrates its greatest potential.

There is nothing strange or anomalous about this *per se*. It is absolutely logical for human beings to settle and carry on their lives in the places where

[4] This section draws heavily upon a number of baseline analyses prepared by the Subsecretaría de Medio Ambiente (Department of the Environment). A good summary of these studies is to be found in the booklet entitled *Gestión ambiental en la Argentina* (published by the Ministerio de Salud Pública y Medio Ambiente, 1980), which was prepared by Alicia Toribio in collaboration with the author.

natural conditions are most favourable. This has, however, produced one of the most dominant characteristics of the country's economic and social structure, a pronounced regional imbalance between the pampas and the rest of the country.

The *pampas region* consolidated a highly productive and profitable livestock-farming economy during the nineteenth century and in this century has significantly increased in population as the result of heavy immigration and domestic migration whose counterpart was a significant depopulation of the arid and semi-arid regions. Industrial development was concentrated at the same time, particularly since the 1930s, and this resulted in a much faster rate of expansion in production infrastructure and services than in most of the rest of the country, generating a vicious circle from which the country has not been able and has made no serious planning effort to escape.

This pampas hegemony, monopolizing growth, has become a concrete brake on the development of other regions and, in many cases, has been an important cause of their introversion. This has resulted in backwardness, poverty, over-exploitation of resources for subsistence, insufficient infrastructure and technology, etc., and is largely responsible for the deterioration of the environment in these non-pampas regions.

At the same time, however, the growth of the pampas was so dynamic that the intraregional balance between the availability of certain natural resources and the man-made environment and the population of the region itself was disturbed. This "free for all" altitude in the use of resources and space has resulted in large congested conurbation with a substandard quality of life because of pollution, the lack of green areas and recreation grounds, insufficient services and equipment, etc. The deficiencies are particularly dramatic in large areas of marginal housing where the lack of infrastructure and basic services prevents the attainment of minimum levels, not just in quality but even in decent living standards.

In speaking of the region outside the pampas, the above-mentioned document (Subsecretariat for the Environment, 1980) takes an interesting approach to the environmental state of some prototypical regions, comparing the way and intensity with which the people undertake, or attempts to undertake, its activities and locally satisfy its needs with the real pressure it exerts on the environmental resources and their potential effective and sufficient availability.

The document makes it clear that "it is, nevertheless, somewhat simplified in order to give a generic description, but this description is not sufficient for a more detailed in-depth study of each particular region".

"In fact, starting from the obvious fact that the regions are part of a larger whole –the country, which itself it not self-sufficient either– it must not be forgotten that it is neither feasible nor desirable for every region to be autonomous to the point of satisfying all the needs of its people exclusively from local resources. The fact is that there is an exogenous demand on the

environmental resources of any region from the rest of the population of the country, and at times from outside the country through trade".

With this reservation, it is possible to identify in Argentina, *a first type of region where the size of the local population exceeds the existing availability of environmental resources*.

In these regions, "the lack of economic and technological means or knowledge on the part of the local population and the lack of investment and market pressures have led to extended single-crop agriculture at the expense of the native flora and fauna to soil degradation and to undiversified regional economies; sugar cane in Tucumán, cotton in El Chaco and *yerba mate* in Misiones are examples. Several forests were felled for crops and grazing on unsuitable land or simply to provide firewood. Thus activities were established which barely covered subsistence requirements. In the end, the degradation of the environment impoverished conditions for human life even more, since sufficient resources were no longer generated to finance investment in schools, hospitals, roads and other works needed to cope with the strong and sustained growth of population. Neither did these activities foster the creation of new activities; this led to a lack of employment opportunities for the active population and consequently to large-scale emigration" (Subsecretariat for the Environment, 1980).

There is a *second type of area, sparsely populated, which has considerable reserves of natural resources* whose exploitation largely depends on investment in infrastructure and technology.

"For example, the *Patagonian coast* has abundant fishery and energy resources; they have been little exploited, however, because investment has been small; this together with the unfavourable natural conditions –strong winds and arid land– has discouraged settlement in the zone. On the Patagonian plateau, overgrazing of sheep, together with the wind action, has caused the disappearance of the vegetation cover over extensive areas and, consequently, an increase in erosion. These characteristics have produced a region typified by isolation and separation from the country as a whole.

"The area of the *Misiones forest*, which has important forest resources also requires human action if they are to be used, both in providing physical infrastructure and in legal and institutional regulation. At present, the lack of infrastructure and services and, especially, an irregular land-holding system on the public lands has resulted in often destructive exploitation of the natural resources by the insecurely established population.

"Vast areas of Argentina's *Mesopotamian region*, the area with the largest watershed in the country, confirm the consequences of a particularly exuberant natural endowment: abundant rivers which overflow and copious and intense rainfall which erodes the soil. Floods, which periodically cause environmental problems, are the result not only of natural processes but also of human actions such as the destruction of the original vegetation or neglect of necessary control measures and works. In recent years this situation has

begun to be reversed by the building of many public works, dams, bridges and railroads, which are already producing transformations in the environment. In the near future, new activities will appear and the population will increase as a result of these works. This is the moment to prevent this desired and long-awaited development from generating environmental problems similar to those on the pampas coast.

"There is *a third type of area with relative equilibrium between population and resources*. Equilibrium is used neutrally here and should not automatically be assigned a positive value.

"In fact, a state of relative equilibrium can be positive or negative according to how it has been reached.

"When, for example, equilibrium between the supply of resources and the demand of the local population is reached by population exodus, we consider that the situation is negative since this route leads to a reduction in development possibilities, and equilibrium is maintained by continuous depopulation.

"On the other hand, there are situations in which there is some correspondence between the supply of environmental resources and population's demand, with a relationship such that population growth can be countered by growth in the quantity and diversity of the environmental resources used; in other words, equilibrium reached by a positive route.

"Negative states of relative equilibrium can be found in large areas of the central north-east provinces of the country. Positive states can be found in the oases of Cuyo and the high Río Negro valley, where equilibrium was achieved by human action by modifying adverse environmental conditions –especially aridity– and creating fertile and agreeable environments for human life. This is good proof of what man can achieve when he sets out to improve the environment.

"To sum up, we could say that the environmental state of the country is characterized by a diversity of environments (the result of the combination of different natural conditions and various forms of human intervention), all with their individual problems.

"This diversity is explained, however, by the unique history which created it. This shows how the predominance of one region, the pampas, which has the greatest variety of environmental resources and the largest concentration of population, has largely determined the weak development of the other regions, a situation which has been avoided only by those regions where human activity was able, in some respects, to develop with greater autonomy from the pampas coast" (Subsecretariat for the Environment, 1980).

All of this makes it evident that the great regional imbalances in the economic and social development of the country strongly influence the state of the national environment, and that development planning which generates a sustained and regionally balanced growth is an irreplaceable tool for the conservation and improvement of the environment.

An approach tied less to the "spatial" structure of the society-nature relationship and centered more on specific consideration of the most pressing environmental problems leads us to identical conclusions.

Here are some examples:

a) *The degradation of living resources*

Gallopin points out (Gallopin, 1983) that the country has some 44 million hectares of *native forest* whose irrational exploitation results in a loss of 140 000 hectares a year. "In 1981, the extraction of wood from native forests amounted to 3 600 000 tons, 61% of the total national output (the rest is from cultivated stands). The state of the native forests in Argentina is alarming, and there are serious risks of irreversible deterioration induced by clearing for agricultural or forestry purposes, selective and/or abusive felling, accidental and intentional fires, overgrazing and the use of the forest for livestock grazing in the wrong season."

The aspects of forestry policy which Gallopin finds most critical are: lack of information about the ecology of the native species, ignorance of forest behaviour under different types of management, deficiency of forestry statistics, lack of cost-benefit studies of different forestry activities, insufficient attention to exploitation and extraction regulation, deficient knowledge of stocks and the quality of the native forests, and ignorance of the rate of felling and its ecological consequences. (Some of these consequences, particularly in the Plate basin, will be discussed below.)

With regard to wild flora and fauna, Gallopin emphasizes the economic importance of their rational exploitation, especially over the vast extent of 60% of the national territory which is not suitable for large-scale agricultural exploitation. "In 1980, he says, 45 000 tons of wild animals were harvested, and the foreign exchange from their export totalled US$171 million. Approximate calculations suggest that, with rational management, one million tons could be harvested per year. However, and in spite of the advance in scientific knowledge, in Argentina wildlife has been exploited traditionally and as a non-renewable resource. Moreover, in some cases domestic species are introduced without taking into account the fact that native species are more profitable and better adapted to local conditions."

b) *Undervaluation of and insufficient resource allocation for the management of protected areas*

It is well known that the protected areas, in conserving genetic diversity and representative samples of the various natural or only slightly altered ecosystems in the country, have not only ecological, educational, scientific and recreational value but also economic value, which Gallopin sums up as:

"the capacity to generate new varieties for agricultural use and the direct exploitation of edible species; to provide organic elements for the pharmaceutical industry and medicine; to provide experimental organisms for studying the effects of new medicines; to provide a large variety of fibres, woods, resins and oils for industrial use; and other potential uses, not yet explored".

The country has protected areas under national, provincial and municipal jurisdiction, but the effective management of these areas shows very different degrees of efficiency. Gallopin says that "the evolution of the system of protected areas has suffered from a large dose of 'free for all'. Although there has been progress in the criteria for selecting areas, in many cases it has been a question of accepting what is left to conserve, rather than making the optimum choice. Also, there is a shortage of qualified staff and financial resources for managing the areas".

Several of the country's ecological systems are under-represented, and some species have become practically extinct.

Furthermore, "the areas next to the protected areas are being profoundly modified by the extension of the agricultural frontier, timber exploitation, urbanization, mining, petroleum exploitation, road-building and other human activities. The protected areas are steadily becoming "islands" surrounded by heavily altered environments; this jeopardizes the possibility of maintaining the variety of species".

c) *The expansion of the agricultural frontier*

After affirming that "the advance of the agricultural frontier is the process which most affects renewable natural resources in Argentina, because of its speed, extent, technological and social mode of operation, the types of ecosystems it involves and the future options it closes", Gallopin points out which large Argentinean ecosystems are suffering from this process: a) the subtropical jungles in the north-west and north-east; b) the semi-arid areas on the periphery of the wet pampas; c) the areas of frequent flooding in the mesopotamian zone (Corrientes and Entre Ríos provinces); and foothill areas in the provinces of Río Negro, Neuquén, and Chubut.

"It is important to emphasize", continues Gallopin, "that in Argentina, unlike many other countries of the continent, the area of arable land, its quality, and the population density are not limitations requiring the expansion of the agricultural frontier. More seriously still, past experiments in expanding the frontier have been based not so much on long-term, sustainable agricultural development as on the destructive use of the forest, the wildlife and the land. After despoiling the virgin resource, the projects have generally been abandoned".

In Argentina's Plate basin subregion (north-east and part of the north-west of the country) the expansion of the agricultural frontier in

Argentina, Brazil and Paraguay, mainly at the expense of the natural forest, is the main cause of the increasingly catastrophic floods on the Argentinean coast, as well as the loss of soil by water erosion; and there is a serious risk of silting up the reservoirs, both built and under construction, with the increasingly abundant sediments carried down by the water.

On the basis of data from Phillipe Culot (FAO, August 1983), Kugler points out that by 1980, 47 102 000 hectares had been deforested in the Plate basin and only 4 713 000 hectares reforested. In Argentina alone, 1 202 000 hectares were cleared and only 78 000 reforested. In the Brazilian part of the basin, 44 490 000 hectares were felled and 4 635 000 hectares planted (Kugler, 1984). The devastating effects which the run-off from tropical rains is causing by carrying away the deforested soils in the Brazilian States of Río Grande do Sul, Santa Catarina and Paraná are impressive and affect the whole of the basin. Borlaug has said: "I can sum up the seriousness of the erosion problem in Brazil in a single sentence: Brazil is going to sea via the River Plate" (Borlaug, 1983).

It is worth noting one more example of how this irrational water and soil management by all the countries sharing the Plate basin affects and obstructs economic development and generates serious diseconomies: the navigable routes of the Paraná delta carry per year, 250-300 grain boats, 120-150 oil tankers, and 150 general cargo ships which carry, in one direction or the other, 15 million tons of grain, 5 million tons of iron and coal, and 6 500 000 tons of petroleum, among other things. Since the Martín García canal, the most important navigation channel between the Paraná river and the port of Buenos Aires on the River Plate, only allows the passage of boats up to 24 feet draught in 1976 the Mitre canal was built and inaugurated, extending navigation, by means of a large investment, to 32 feet draught allowing the passage of larger boats and thereby economizing on shipping. In December 1982, as a result of the increasing natural sedimentation, aggravated by the great floods, the canal, which was losing its original draught capacity, declined to only 17 feet capacity. According to calculations of the river and marine transport authorities, restoring the canal to its original capacity would mean removing 8 500 000 cubic metres of sediment at a cost estimated at US$17 million (Kugler, 1984),[5] and meanwhile, shipping has to be done in smaller boats, or at half cargo if they are putting out to sea from the Paraná ports, completing their cargo in the ports of Buenos Aires and Bahía Blanca; this last port is so overcrowded that delays are usually 40 days at US$5 500 a day (Kugler, 1984).

Is a better example necessary of the diseconomies generated by environmental deterioration?

[5] The opinions of the Subsecretary of River and Marine Transport can be seen in the newspaper *La Nación*, Buenos Aires, 11 February 1984, quoted in Kugler, 1984.

d) *Alteration of water systems*

In spite of repeated recognition at the conceptual level, integrated management of river basins has not taken sufficient root in water resource management in the country –or, as has already been seen, in resources shared with other countries, especially the Plate basin– or in related land-use and ecosystem management.

In the Plate basin, in spite of what has been said above, the high degree of "spontaneity" with which decisions are made about large hydrological works and the location of production activities and human settlements is notorious from the land-use regulation viewpoint.

Evaluations have been and are being made of the environmental impact of the most significant hydrological works, recent and under construction, but always of projects already approved or underway, making the possibility of participation very small; in other cases, the transferring of technical and scientific conclusions to the political decision-making level has been notably insufficient.

Pollution problems caused by uncontrolled location of production activities and human settlements and by the lack of waste treatment, above all in the part of the basin between the city of Rosario and cities of La Plata, are serious and sufficiently well-known.

Conclusions

In the above paragraphs we have tried to cover the dominant characteristics of the Argentinean environmental problem and have seen how unordered economic growth has generated profound differences in the environment and the quality of life among the various regions of the country, as well as serious degradation in some cases and underuse in others of natural resources which, rationally used, could permit balanced, sustained and autonomous development.

This contention is in no way novel. The basic characteristics of the historical evolution of Argentinean development have been studied and described by various technical teams, both in the public sector –starting especially with the CONADE studies from the 1960s on– and in private study and research centres. In recent years various studies of the resulting environmental configuration have been added.

It is true that the dictatorship (1976-1983) provoked changes and introversion perhaps not yet sufficiently measured and evaluated. However, this does not affect the core of the diagnosis. The in-depth action required by the situation is much more dependent on effective political will for change than on technical improvements.

The consolidation of the reborn democratic system largely depends on reaching the national development objectives postponed by authoritarianism.

We mean in other words that development planning and the incorporation of the environmental dimension in it is more than a technical problem: today more than ever it is a political problem of such importance as to be of the main affirmations of the new democracy.

If this is accepted, a series of questions immediately arises: What agency of the State apparatus should have the main responsibility for meeting this political challenge? How would bureaucratic decision-making flow through this agency? What adjustments would be advisable?

We shall try to answer these questions in the following two sections.

2. The present structure of Argentina's government and environmental management

The national government is made up of three powers: the executive, the legislative, and the judiciary.

In the exercise of his executive power, the President is advised by eight ministers and by the five secretariats responsible directly to him.

In turn, the ministries are broken down into secretariats of State, and these into subsecretariats and the subsecretariats in national or general offices, as the case may be.

a) *Office of the President: General Secretariat and Planning Secretariat*

The five secretariats of the Office of the President are:

- General
- Planning
- State Intelligence
- Public Information
- Civil Service

Those which particularly interest us are the General Secretariat and the Planning Secretariat. The first is responsible among other things –through the Co-ordination Subsecretariat– for advising the president on the co-ordination of the various areas of the Executive Authority to ensure political and functional coherence and a smooth relationship with the members of the legislative bodies.[6] The Planning Secretariat advises the President on the integrated planning process for economic and social development.

The Planning Secretariat has both formal and substantive responsibilities related to development planning and the insertion of the environmental dimension.

By "formal responsibilities" we mean those granting this Secretariat specific authority –of some weight, given that it is directly responsible to the

[6] For a detailed description of the responsibilities and functions of the different areas of the National Executive Power, see the Law of Ministries No. 22520 (t.o. 1983) and Decrees Nos. 15/83, 134/83, 431/83, 267/84 and 1705/84.

President– to co-ordinate and harmonize the policies, programmes, plans and projects of the entire public administration. These responsibilities are essential for the implementation of any development plan and as in our case, if the plan includes the effective incorporation of the environmental dimension.

They are:

i) To formulate the directives of the Executive Authority to the different areas of the public administration to adjust sectoral and regional plans and make them compatible with global planning, as well as to draw up economic, social, public works and services plans, programmes and projects.

ii) To co-ordinate intersectoral and regional planning and programming of the public administration.

iii) To establish links between the planning units of the different ministerial areas.

iv) To intervene in the co-ordination and harmonization of large public investment projects which are of national interest because of their economic or social significance, as well as in private investment projects which, for the same reasons, require approval, authorization or licensing by the competent authority.

We call "substantive responsibilities" those which the Planning Secretariat undertakes principally, or in some way participates in or intervenes in, to define and implement the objectives and content of policies and development programmes, including their environmental aspects. These are:

i) To evaluate long-term development possibilities and formulate guidelines for analysing problems from the long-term viewpoint.

ii) To analyse, formulate and evaluate proposals for national objectives, policy and strategies for development planning.

iii) To propose development objectives and policies, and global and regional medium-term plans.

iv) To formulate general criteria for the plans and programmes envisaged in global planning.

v) To monitor and evaluate programmes and projects in the national plan, assessing their environmental and regional impacts and proposing corrective or complementary measures where necessary.

vi) To formulate land use objectives, policies and directives.

vii) To intervene in the formulation of objectives and policies for environmental regulation and preservation and the rational use of natural resources, directing them to the most appropriate production sectors.

viii) To prepare research and professional training programmes related to planning tasks.

ix) To co-ordinate and direct national statistics and census systems and help to and formulate the objectives and policies for collection of the data needed for the global planning process.

Finally, it should be pointed out that four subsecretariats report to the Planning Secretariat:

- General;
- Development Programming;
- Co-ordination and Programming with the public sector; and
- Long-term Analysis, which is responsible for criteria for the formulation of land-use and environmental preservation objectives and policies, through the National Office for Research and Analysis.

We must not neglect to point out that this set of responsibilities is the same as has repeatedly been given to the successive planning agencies of the national government over the last 25 years, which had little success in co-ordinating the various administrative sectors and agencies of State activity in its development policies.

However, before returning to this –to analyse the reasons for this meagre success and to formulate suggestions for improving State operations– it seems necessary to outline some of the responsibilities of the various ministries, by virtue of which they play a greater or lesser role in the effective carrying out of a medium-term development strategy, both in directly environmental aspects and in those which at first sight do not appear to be so but which, in the light of the diagnosis we have made of the country's particular environmental problem, are strong determinants of any proposed policy for reversing the environmental problems we have indicated as most pressing and, at the same time attacking in the medium-term problems resulting from the spatial structure and style in which the society-nature relationship has developed in the country.

b) *Ministry of the Interior*

Domestically –just like the Ministry of Foreign Relations internationally– the Ministry of the Interior is the policy agency of the national government, *par excellence*. Some of its responsibilities are fundamental to the design of the model for environmental management in development which we are going to propose. They include the following:

i) Without impairing the sectoral relationships of the other national ministries with their provincial counterparts, the President articulates the Federal Government's global policy with the provincial governments through this Ministry.

ii) It is the main body responsible for population policy, drawing up and applying the norms governing internal and external migration and intervening in the creation of favourable conditions for settlement of population nuclei in zones of low demographic density and geopolitical interest, and in the drawing up of development policies for frontier areas.

iii) Given the jurisdictional questions involved, it is concerned with the legal régime of the waters of interprovincial rivers and their tributaries.

Of the three subsecretariats of this Ministry (it has no State secretariats), the Subsecretariat for Institutional Affairs and the Subsecretariat for Technical and Economic Affairs are responsible for the functions described.

c) *Ministry of the Economy*

The Ministry of the Economy represents a particularly important area for our subject.

First, because all policy relating to mineral and renewable natural resources, except water, is developed there.

Through the Secretariat for Agriculture and Livestock it is in charge of national agricultural policy and the conservation, recovery, defence, protection and development of the related natural resources (flora and fauna). An autonomous dependency of this Secretariat is the National Parks Administration; although its jurisdiction is limited exclusively to protected areas, it is the only strictly conservationist sector of the Secretariat. Although the National Wildlife Office (in the Subsecretariat for Agriculture), the National Institute for Agricultural Technology (INTA), and the National Forestry Institute (IFONA) have developed and continue to develop protection programmes for wild flora and fauna and soils, all the Secretariat's actions show a very pronounced bias towards production. Two institutional factors, which we shall return to below, must be added: first, water resources are the exclusive responsibility of another Ministry (Public Works and Services); second, the National Constitution gives parallel responsibilities to provincial agencies in various areas of competence of the Secretariat for Agriculture.

Furthermore, through the Secretariat for Mining and the Secretariat for Marine Resources, the Ministry of the Economy is responsible for policy in these areas except, in the first place, for coal and petroleum which, together with gas, fall within the competence of the Ministry for Public Works and Services and are entrusted to specific State corporations.

However, in the second place, the importance of the Ministry of the Economy for a policy of making development compatible with the environment, given the characteristics of the Argentinean environment problem, lies in the fact that bodies such as the Secretariat for Industry are responsible to this Ministry and make sectoral development decisions which affect the location of installations, industrial technology and production inputs whose environmental relevance is obvious (the National Institute for Industrial Technology (INTI), which carries out industrial research, is also responsible to this Secretariat). In addition, the recently created Secretariat for Regional Development has been given responsibility for designing, implementing, and monitoring policies related to regional outputs and for implementing all activities for the promotion of regional development; it could therefore play a very significant role in helping overcome the

imbalances between the pampas region and the other regions which, as explained above, affects the environmental make-up of the country.

d) *Ministry of Public Works and Services*

Within the Ministry of Public Works and Services, the ministry *prima facie* most closely related to the environmental issue, the Secretariat for Water Resources is responsible for designing and monitoring national water policy and co-ordinating plans, programmes and projects related to non-marine water resources, in order to ensure their correct study, exploitation, use and preservation.

It should be made clear, however, that the National Constitution and the Civil Code give exclusive responsibility for surface water to the provinces, and national jurisdiction is exclusively over navigation on rivers which cross provincial borders. However, the use of these interprovincial rivers for navigation is the responsibility, not of the Secretariat for Water Resources, but of the Secretariat for Transport (Subsecretariat for River and Maritime Transport) in the same Ministry of Public works and Services.

By this we mean that, although most of the country's watersheds cover more than one province, the fact that each province has its own water legislation and its own authorities, and where there is national jurisdiction –navigational use– the Secretariat for Water Resources has no competence greatly limits this agency's possibilities for action, in spite of the fact that since its creation it has maintained a clear and correct ecological approach to integrated watershed management. The efforts of this agency to encourage agreements among the provinces, through Watershed Commissions, have with few exceptions met with little success and very serious interruptions, for reasons ranging from insufficient political backing for managing a legally shared area to local rivalries between upstream and downstream provinces and between provinces and places sharing the same waters.

The National Sanitation Works Corporation, responsible to the Secretariat for Water Resources, is charged with drinking-water supply and the control of pollution from domestic and industrial sewage in Buenos Aires and parts of Greater Buenos Aires. The control of pollution caused by navigational use of rivers and seas is the responsibility of the National Ports Administration (Secretariat for Transport) in the ports, and of the Argentinian Naval Prefecture (Ministry of Defence) in waters outside the ports. The National Institute for Water Science and Technology (INCYTH), also responsible to the Secretariat for Water Resources, undertakes research and makes diagnoses on the condition, use and exploitation of the rivers.

However, as in Economy, the Ministry of Public Works and Services has a set of responsibilities and agencies which make its role very important in the society-nature relationship.

For example, the Secretariat for Energy formulates the proposal for the country's national energy planning, with respect both to technological options and to implementation and location priorities, reconciling regional needs and demands with profitability of energy output. It is responsible for the National Energy Plan. In Argentina the experience of recent decades indicates that, given the necessary financing, the main difficulty in solving a large part of the environmental problem through development is not energy production –in view of the abundance of resources and the variety of possible and proved technical options– but the territorial distribution of energy produced and to be produced. In fact, to date, the energy produced by large hydroelectric projects, such as those in Patagonia and Salto Grande, has been almost entirely absorbed by the urban-industrial hyper-complex on the Rosario-Buenos Aires-La Plata axis, depriving the production areas of the possibility of significantly increasing their energy supply and thus aggravating the regional imbalance. No one can doubt that a better supply of hydroenergy in the interior and, for the sake of justice, in the regions which have the water resources, would favour their development and environmental improvement and, at the same time, slow down the concentration process in the urban-industrial axis.

A similar environment and development dimension can be given to the Secretariat for Transport, responsible for the National Transport Plan, and to all the agencies reporting to the Ministry which plan and build national works and services infrastructure, both for their significance as development tools and for the possible environmental impact of their projects (National Roads Office, State Railways Corporation, National Telecommunications Corporation, Water and Energy Corporation, Hidronor, State Oil Fields, State Coal Fields, State Gas, etc.).

e) *Ministry of Education and Justice*

It is unnecessary to underline the responsibility of the Ministry of Education and Justice in the environmental management of development, because of the responsibility of the Secretariat for Education for formal environmental education and of the Secretariat for Culture for creating public awareness of the environment –with the co-operation of the Secretariat for Public Information of the Office of the President. However, this Ministry also includes the Secretariat for Science and Technology, which is responsible for formulating and implementing policies for scientific and technological development and promoting and financing research in this field and is therefore able to promote alternative and environmentally appropriate technologies.

f) *Ministry of Public Health and Welfare*

In this rapid review of the environmental roles of the various agencies of the Executive Authority, we have deliberately left the Ministry of Public Health and Welfare to the end. The Secretariat for Housing and Environmental Regulation is in this Ministry and is –at least according to the Law of Ministries– what could be called the "environmental agency".

At this point it is necessary to make a brief historical reference. As a result of the conclusions of the 1983 Stockholm Conference, the Secretariat for Natural Resources and Human Environment was created in the Ministry of the Economy. This connection with Stockholm was apparent in three ways. First, the policy decision of the Government of the time was founded explicitly on the need to adjust the administrative structure to the incipient world movement, which the Conference had taken up from the underdeveloped countries, to harmonize development and environment. Second, being located in the Ministry of the Economy where many other previously dispersed responsibilities were concentrated in 1983, it became in practice a ministry of planning and implementation for national economic development (remember, that this Ministry absorbed a series of agencies which had previously held the rank of autonomous ministries, such as Finance, Agriculture, Industry and Mines, Public Works, Transport, Energy and Communications, and the National Institute for Economic Planning). Third, in its internal structure, which is described below, the Secretariat was conceived of as an effort to incorporate the holistic concept in environmental management –as was also being attempted at that time, in countries such as Venezuela, Brazil and Mexico.

The Secretariat had four subsecretariats:

i) The Subsecretariat for Renewable Natural Resources, which was a new agency at that level, although it was formed by concentrating subagencies previously in the Ministry of Agriculture: wild flora and fauna, freshwater fisheries, the National Parks Service, and the National Forestry Institute (IFONA).

ii) The Subsecretariat for Mines, which had historically been connected, with ministerial rank, to Industry.

iii) The Subsecretariat for Water Resources, also already in existence and including the National Administration for Sanitation Works (drinking water supply, sewage treatment and water pollution control in the areas it served, which were the Federal Capital and several provinces), the National Institute for Water Science and Technology (INCYTH), and the National Drinking-Water Service (SNAP), which supplied drinking water to rural areas.

iv) The Subsecretariat for the Human Environment, which was the genuinely new agency in the Secretariat and whose responsibility was to formulate guidelines for a global national environment policy, including within its competence environmental evaluation, land use, the environmental

impact of human activities, promoting environmental legislation and education, and water, air and soil pollution. It also was responsible for technical advice to the Ministry of Foreign Affairs in its relationship with international environmental agencies, especially UNEP and the MAB/UNESCO Programme.

Unfortunately this effort at institutional adjustment to the new environmental issue had very little time for experiment since, with the rupture of the constitutional order in March 1976, the Secretariat for Renewable Natural Resources and the Human Environment was dissolved and the four agencies divided up as follows:

i) The Subsecretariat for Renewable Natural Resources passed with this rank to the Secretariat for Agriculture (Ministry of the Economy);

ii) The Subsecretariat for Mines became an autonomous State secretariat within the Ministry of the Economy;

iii) The Subsecretariats for Water Resources and the Human Environment (the latter called first Environmental Planning and then Environmental Regulation) were made dependent on the Secretariat for Transport and Public Works (Ministry of the Economy).

In December 1980 the hitherto Ministry of Public Health became the Ministry of Public Health and Environment, and the Subsecretariat for Environmental Regulation, under the name Subsecretariat for the Environment, was removed from Transport and Public Works (and therefore from the Ministry of the Economy) and associated with Health, incorporating the theme of environmental restoration which had always been in the health sector.

In December 1983, with the return to a constitutional régime, this Ministry became the Ministry of Health and Welfare; it has five State secretariats:

- Health
- Sport
- Social Advancement
- Human Development and Family
- Housing and Environmental Regulation.

This Secretariat plans a Subsecretariat for Housing and Environmental Regulation but, after a year of constitutional government, its organic structure has still not been announced; so it continues to operate, with some modifications, through the original National Offices which belonged to the original Subsecretariat for the Human Environment (1973).

The Law of Ministries, article 24, establishes that the Ministry of Health and Welfare is responsible for advising the President on everything relating to public health, environment, social advancement and assistance, protection of the family, housing, welfare holidays and sport. Among the many responsibilities listed in the article for the Secretariat for Housing and Environmental Regulation, the following are of an environmental nature:

i) To participate in the preparation and control of norms relating to environmental pollution with the co-operation of the relevant sectors;

ii) To participate in the preparation of the norms for regional environmental and human settlement programmes in accordance with national land-use policies;

iii) To participate in the preparation of norms for environmental preservation with reference to future land and natural resource use, with respect to the location of economic activities;

iv) To participate in the preparation of norms for environmental preservation with respect to infrastructure works;

v) To participate in the organization, direction and control of a register listing sources of emission and discharge of pollutants;

vi) To participate in the preparation of development policies for frontier areas and undertake their implementation in its area of competence.

3. Critical evaluation of the present Argentinean State apparatus from the viewpoint of inserting the environmental dimension in development planning

We believe that to make a serious and profound evaluation which, above all, will be useful for supporting institutional proposals for overcoming the present situation, it is necessary to analyse, not simply "formally" –limited to how appropriately the State apparatus is organized according to the letter of the norms assigning responsibilities to the various agencies– but including specific dynamics, or to put it another way, the past behaviour of the State apparatus, its effective response to this 1970s idea of making development and environment compatible.

In the second place, this analysis, from the viewpoint of the formal and of the actual dynamics of the State, should not limit its coverage to the environmental and development planning agencies, but should include other State sectors whose actions are fundamental in defining a type and style for the relationship between Argentinean society and its base in nature.

a) *The environmental agency and the incorporation of the environmental dimension in Argentinean development planning*

From the formal viewpoint and with respect to the political will underlying its creation in 1973 it is undeniable, as we have already said, that the Secretariat for Natural Resources and the Human Environment was strongly influenced by the fashionable modern theory of making development and environment compatible, which was strongly supported at least in principle at the 1972 Stockholm Conference.

This can be seen from three angles:

i) The new Secretariat is located in a new type of ministry, the Ministry of the Economy –which, because of the number of agencies it absorbed, as

stated above, has become a real superministry– where, simultaneously, the Secretariat for Economic Programming and Co-ordination was created, which enjoyed special status not only by its function of co-ordinating the other Secretariats of the Ministry, but also by its function of planning national development through the National Institute for Economic Planning which succeeded the old National Development Council (CONADE), to be discussed below in a short history of development planning in Argentina. In this institutional framework, obviously, the creation of the environmental agency in the bosom of the Ministry responsible for development planning was undoubtedly formally correct;

ii) The Secretariat for Natural Resources and the Human Environment implied an attempt at the administrative concentration of agencies managing natural resources which until then had been dispersed, such as mines, water resources, flora and fauna, freshwater fisheries, protected areas, drinking water supply and water pollution, and forestry plantations, with the addition to all these of a new agency, the Subsecretariat for Human the Environment which, supposedly, would provide the guidelines for a global environmental policy which, together with facilitating the orientation towards ecosystematic management of those natural resources, would try to harmonize the society-nature, or natural environment-human environment relationship.

iii) Cohabitation in the same Ministry seemed to offer a magnificent opportunity to influence with appropriate environmental arguments the sectoral policies of a series of agencies related to development of the production and services sectors and to the national infrastructure, such as public works, transport, energy, agriculture, communications and industry. After all, the only sectors with environmental concerns left out were education, health, urban development and tourism (the last three in the Ministry of Social Welfare).

The premature dissolution of the Secretariat in March 1976, less than three years after its creation, makes very relative any judgement on this first Argentinean experiment in environmental management from the global perspective of harmonizing development and environment.

On the one hand, the delay in approving the organic structure of the new Subsecretariat for the Human Environment –which only received presidential approval in 1975– prevented the timely incorporation of the necessary resources for breathing life into the new global criteria expected from this agency or for beginning the studies for a preliminary diagnosis of the environmental situation in the country, which went beyond the sectoral studies of the various natural resources (which, with few exceptions, were the only studies in existence) and which, at the same time, made it possible to demonstrate existing interrelationships between the prevailing development style and the state of the natural and social environment.

On the other hand, as with every administrative reform it was obvious that the normative and structural modifications would not automatically relate to

reality. The intention of the restructuring, to include in a common policy such traditional and sectorally oriented agencies as Mines, National Parks, National Forestry Institute, National Sanitation Works, and –to some extent– Water Resources and Wild Flora and Fauna and Fisheries, was not of course easy and could not be achieved from overnight. In any case, the something more than two years which it lasted was totally insufficient for redirecting policy in these areas towards the new environmental conception –which, it must be admitted, was a very abrupt break with the former sectoralist "ideology"– and for consolidating interdisciplinary methodologies in technical teams, the great majority of which had not been trained to use them.

At the same time, the effective incorporation of the Secretariat in the bosom of the superministry was extremely weak and, beyond its participation in preparing the chapter on environment in the Three-Year Plan, 1974-1977 (Decree No. 776/73), could only occasionally and in a few cases influence the development policy followed at the time. (A policy which never overcame the short-term view, except in industrial promotion and programming large infrastructure works.)

This can be partly attributed to the fact that the Secretariat's "institutional personality" –owing to endogenous reasons and the time-limitations indicated– was never sufficiently developed to have "outside" influence of the necessary strength and coherence; but it is also true that the "formal" political will expressed in its creation was not backed up in practice by the necessary political will in the higher levels for it to make its presence felt in the decision-making process of economic and social development, either in its global aspects or in the sectoral aspects covered by the other important agencies of the Ministry of the Economy itself.

In sum, the effort made and the political and technical investment involved in creating and starting up the Secretariat, especially when it is remembered that this was the first effort to try to achieve global management of the environment in the country, deserved a better fate than abrupt frustration by the dissolution of the Secretariat and the dispersal, already described, of its responsibilities by the military régime which usurped power in March 1976. This is particularly so in view of the strong evidence that this dissolution was due not to any management failings of the Secretariat but, on the contrary, to the obstacles which its institutional consolidation, its scientific, technical and programmatical output and its policy proposals might represent for the dependent economic model, based on the Chicago School, that the military dictatorship imposed on the country.

To show that this is not pure rhetoric, here are two examples.

Of the four Subsecretariats making up the Secretariat for Natural Resources and the Human Environment, only one, Mines, at the level of State Secretariat, was made directly dependent on the Ministry of the Economy, and in fact all policy in this area, which during the previous constitutional government had tended to favour and promote small and medium-sized

mining companies, turned towards the development of large-scale mining connected with multinational capital which, it goes without saying, has no interest in any type of ecological consideration; a specific example is the large El Planchón copper project (San Juan Province), run by the Minera Aguilar Company, a transnational subsidiary.

The new economic model meant the disruption of the country's industrial production apparatus and the promotion of the livestock sector by strongly concentrating ownership in the sector in order to make Argentina primarily a food producer in the international division of labour. For this reason, then, the Subsecretariat for Renewable Natural Resources was reincorporated in the Secretariat for Agriculture and, from that base, was the sector of the Administration which most strongly opposed the approval of a general environment law with the argument that allowing the rational use of natural resources, if this meant "ecological rationality", was absurd since "the exploitation of natural resources recognizes no other rationality than the economic".

The two remaining areas of the Secretariat for Natural Resources and the Human Environment became dependent, as has been pointed out, on the Secretariat for Transport and Public Works (Ministry of the Economy). We refer to the Subsecretariat for Water Resources and the Subsecretariat for Environmental Planning which soon changed its name to Subsecretariat for Environmental Regulation, successor to the original Subsecretariat for the Human Environment.

We have already described the erratic path in the bosom of the State bureaucracy followed by this latter Subsecretariat from 1976 to date. It must only be remembered that it was tied successively to, first Transport and Public Works, then Public Health, and now Housing.

The first notable relevant characteristic discovered in analysing the activity of the Subsecretariat between 1976 and 1984 is that of an authentic "institutional cyst" in higher-level administrative agencies (the various State secretariats to which it had been successively moved). By this we mean that its technical output and activities as a whole were never enriched or guided by political directives from higher institutional bodies or, even less, taken up by these bodies and translated into coherent and stable policies, even of a sectoral nature, or into a national environmental policy which the country needed and still needs.

It is fair to say, in the second place, that while we acknowledge a merely vegetative will for survival originating in its prolonged parasitical situation, the Subsecretariat has developed a series of studies and activities which should not be discounted in a future institutional adjustment, for they do have potential. In the following paragraphs we would like to refer briefly to these areas of work because we are convinced that, if the environmental issue is ever taken out of the catacombs of the Public Administration where it now lies, some of these areas of study should be continued and given priority.

Otherwise, it could be thought that the institutional experiment in environmental matters in Argentina between 1973 and 1984 has taught no positive lesson, and we do not believe this.

These areas of study are the following:

i) The Permanent Environmental Evaluation Programme which made a diagnosis of the country's environmental situation and delimited environmental regions, as well as providing a sufficient technical basis for inserting a national environmental policy in the national development strategy which can operate regionally and in the long and medium term and also allows short-term action on critical situations as they are detected;

ii) The Programme for Evaluating the Environmental Impact of Infrastructure Works which, although it has concentrated especially on hydroelectric plants (Salto Grande, Yacyretá, Casa de Piedra, etc.), has developed a methodology and practical experience which, with due adaptation, will make available in the future trained staff for evaluating other kinds of projects;

iii) Pursuant to the Law Promoting Industry, the Subsecretariat has been studying for years the environmental effects of industries which seek the benefits of the promotion policies and recommending technical solutions to problems resulting from the location of industries or from waste treatment;

iv) The Programme for Education and Environmental Information has made some experiments in the formal educational system and in training, as well as in the preparation of publicity material, both written and audiovisual. Moreover, the Subsecretariat has acted as a focal point for the RED Programme (UNEP/ORPALC) and the INFOTERRA Programme (UNEP);

v) The Programme for Institutional Relationships has provided various opportunities for co-operation with provincial and municipal agencies and, internationally, with the United Nations Environment Programme (UNEP) and the MAB/UNESCO Programme which has an Interministerial Committee in the country made up of 14 agencies, with a permanent secretariat is the Subsecretariat.

b) *The national planning agency and the incorporation of the environmental dimension in development planning*

Argentinean experience in development planning shows two clearly dominant characteristics: the lack of administrative continuity and a decreasing transfer of plans to the area of political decision, to the extent that we would say that, at least for medium- and long-term global and regional planning, this transfer has been practically zero since 1976.

Planning experience started in 1945 with the creation of the Technical Secretariat of the Office of the President which drew up the First Five-Year Plan (1947-1951) and the Second Five-Year Plan (1952-1957); the latter, approved in Law 14 184, introduced a regional approach for the first time.

This Technical Secretariat was dissolved in 1955, and until the creation in 1961 of the National Development Council (CONADE) –in keeping with the recommendations of the Punta del Este Charter and the Alliance for Progress– there was no development planning agency in the National Executive Authority. It should be noticed, however, that in 1959, an agreement between the national government and the provincial governments, created the Federal Investment Council (CFI), an interesting multilateral agency, which still exists, for promoting harmonious regional development by advising the provinces on studies and projects and formulating regional, urban and sectoral plans.

In 1964 CONADE produced the National Development Plan (1965-1969), which can be considered the first medium-term, integrated development plan. Partly because of the constitutional breakdown in 1966, it never became more than a great document inspiring a number of disjointed sectoral policies, and was never a tool for directing global and regional development.

The military government imposed between 1966 and 1973, with various administrative vagaries of no interest here, kept the CONADE Technical Secretariat and produced the National Development Plan (1970-1974), the National Development and Security (sic) Plan (1971-1975) approved by Law 19 039, but both suffered the same fate as the 1964 Plan.

The 1973 constitutional government dissolved CONADE and entrusted development planning to the above-mentioned Secretariat for Economic Programming and Co-ordination (Ministry of the Economy) through the National Institute for Economic Planning (INPE). Previously, a special Committee, presided over by the Ministry of the Economy and made up of all the Ministers of the National Cabinet, produced the Three-Year Plan (1974-1977) which, as has been pointed out, was the first plan to set environmental objectives.

After the military coup in 1976, the Ministry of Planning was created and soon became a Secretariat directly responsible to the President. Although it made some valuable diagnoses and technical proposals, above all for land-use regulation, in eight years it never produced –in keeping with the liberal and dependent philosophy of the régime– any type of global plan or any guideline whatsoever on the subject.

With the return of constitutional government (December 1983), this Secretariat for Planning became the present Secretariat for Planning, responsible to the President and with the responsibilities mentioned above. During 1984 this Secretariat has been primarily involved in the negotiations for solving the problem of the very heavy foreign debt and drawing up the national budget, as well as determining its own internal structure, and only recently has it prepared a medium-term plan.

Over these years, particularly since the 1960s, the provinces and municipalities have also established planning agencies in their respective jurisdictions.

To complete this brief and merely formal description of Argentinean development planning experience with a close look at its efficiency and dynamism, we can think of nothing better to offer than a paper by Jorcino de Aguilar, who speaks with the authority of several years experience of technical work in Argentinean planning agencies (Jorcino de Aguilar, 1984).

"In most cases, he says, the technical proposals were not accompanied by political decisions making their implementation possible, and some studies included no indication of the tools necessary for carrying them out.

"In the political arena, no decisions were even made on accepting, modifying or rejecting the proposals; the documents became mere library or archive material and were published by technical magazines, which limited their reach to a small group of specialists.

"In other cases, the proposals were only partly carried out through sectoral plans which solved immediate problems. The discontinuity of the technical agencies within the government structure has been by far the most serious obstacle to effective and co-ordinated planning action, and studies and research have been underused.

"Furthermore, all this has meant an unnecessary waste of human resources, technical skills, organizational effort and working time, and considerable public expenditure." ..."Also, there was no integrated approach for evaluating sectoral plans and projects, most of which were directed to optimizing the sector. There has been no global model for evaluating the effects of their application (for example, housing plans with the single objective of eliminating the housing deficit, transport plans which by optimizing the sector increased the high level of centralization and regional inequalities, energy plans which were not coupled with the development of backward regions).

"In many cases, large national and regional development projects have been carried out or postponed exclusively on the basis of economic profitability criteria, without an overall view to establish the geopolitical or strategic implications of these decisions.

"The lack of systematic and continuous planning and the absence of an integrated view of the functioning of the country and of an explicit statement of the national and regional roles which should be played in the medium and long term, have had critical consequences with respect to appropriate land use, urban development and environmental regulation".

From this raw analysis, it can be seen absolutely clearly that for many years the whole national government activity, in practice, has completely lacked an effective framework for the global and regional integrated development planning of the country. An obvious consequence of this is that the environmental dimension is not included, in any way, in the global development process and that Argentina has no national environmental policy.

c) *Environmental considerations in the activities of other sectors of the State*

The incorporation of the environmental dimension in the sectoral policies of the various agencies of the National Public Administration which can possibly affect the environment is also absolutely relative and spotty.

With respect to renewable natural resources, first mention should go to the National Parks Administration which manages all protected areas, national parks, reserves and national monuments. However, the pre-eminence of the classical nature-centred approach, which has always been characteristic of this old institution, has frustrated one of the main environmental roles of the protected areas, which is to transfer the enormous capital of knowledge and ecosystemic experience of their management to the rural areas affected by society. With the return of constitutional government a positive and genuine intention to reverse this situation can be seen.

Secondly, the National Institute for Agricultural Technology (INTA) and the National Forestry Institute (IFONA), although logically guided by production criteria, have always incorporated natural-resource protection criteria in their respective projects.

Evaluation of the environmental impact of projects, has only occurred with certain large hydroelectric plants, mentioned above, and some kind of environmental accounting in projects of the industrial promotion system.

As for water pollution, although it is a provincial responsibility, both the National Sanitation Works Corporation –which covers Buenos Aires and some parts of Greater Buenos Aires– and its provincial equivalents have characteristically "decontaminated" water for the public drinking water supply rather than effectively controlling pollution. Suffice it to say that only 5% of industrial installations included in the 10 industrial activities considered by the World Health Organization to be critical for pollution have waste-treatment plants (Government of the Republic of Argentina, 1977). Nor is it certain even in these cases that the plants operate effectively or that treatment is adequate.

Furthermore, the obsolete sewage system of the National Sanitation Works Corporation is one of the main causes of the bacterial pollution of the River Plate at Buenos Aires. The meagre allocation of resources for basic sanitation works and the uncontrolled growth in recent decades of the Buenos Aires conurbation has thus produced the paradoxical effect that the agency charged with controlling pollution has unwillingly become the "polluter"(!).

Finally, the Ministry of Education and Justice has incorporated some environmental concepts in primary and secondary school curriculums (in biological sciences) and research on natural resources and the environment has begun in the Secretariat for Science and Technology.

4. A proposal for institutional adjustment to ensure the incorporation of the environmental dimension in development planning in the Republic of Argentina

The formulation of a proposal for institutional reorganization to seek for the future better, and if possible optimum, harmony between national development and environmental conservation should begin with the series of premises summed up in the following paragraphs.

a) The real and specific consideration of the special characteristics of the national and regional environmental problems. These characteristics have been described in section II.1.

b) The absolute conviction that the serious economic crisis affecting Argentina at the moment, far from an obstacle to solving these problems, should be one of the most important spurs to preventing government policy being taken over by short-term pressures.

The launching of an era of national autonomous and sustained development will only be possible with serious medium- and long-term planning which also receives strong political support in its practical implementation. Today's pressures should not lead us to forget that the future also begins today.

Given this premise, the incorporation of the environmental dimension in this planning and in the national, regional and sectoral policies derived from it, is a necessary condition for authentic sustained development.

Planners and decision-makers must recognize that economic and environmental rationality are not contradictory. The preservation and improvement of the natural-resource base and its intensive but rational use (to assure perpetual availability of renewable natural resources and the slowest possible exhaustion of the non-renewable resources compatible with national needs) offer an incalculable possibility of "maximizing benefits" in the national economy in strategic terms. Conversely, an economic policy which ignores the adequate protection of the environment, while enjoying short-term success, would be a suicidal illusion and absolutely anti-economic in the long run.

c) The technical and scientific experience and environmental awareness which has developed in recent years, as well as the incipient proliferation of non-governmental environmentalist associations, have caused a change for the better in the present situation compared with the situation in 1973 when the Secretariat of Natural Resources and the Human Environment was created. With the limitations mentioned above, the management experience of the Subsecretariat for Environmental Regulation and similar agencies in many of the provinces and large municipalities must also be recognized.

d) This greater degree of collective awareness of the need for and viability of a national environmental policy in the future development process and this capital of accumulated knowledge provide today an excellent

possibility of a reasonable consensus in the national, provincial and local governments, in intermediate associations, and among the public in general, about specific objectives of environmental policy.

The report of the Argentinean Ecology Association, prepared by Gilberto Gallopin in September 1983 for presentation to the political parties, using sectoral technical reports produced by Association work groups and joint discussion meetings, stated these possible objectives well and they are reproduced here (Gallopin, 1983):

- To give priority to and plan the diagnosis, to preserve and use the living national resources and to develop methodologies and technologies for their perpetual study and use;
- To develop a national strategy for the creation, conservation and use of protected areas and other ecological reserves;
- To study, plan and control the expansion of the agricultural frontier to optimize the use of ecological resources and reduce adverse effects on productive ecosystems;
- To require environmental impact assessments before adopting and implementing decisions on development works and the application and dissemination of technology;
- To establish and exercise permanent State supervision and control of the ecological effects of human activities;
- To carry out modern and effective environmental education programmes at all educational levels and for general public dissemination, and to negotiate channels for community participation in decisions affecting the human environment;
- To define and apply international policies for the study, protection and management of shared or common-interest ecosystems and natural resources, within the framework of Latin American integration;
- To incorporate ecological criteria for the sustained use and integrated management of renewable natural resources in national, provincial and municipal policies.

e) It is confirmed that the national environmental problem is closely connected in a cause and effect relationship, with the great development disparities among the regions. This, together with the strong federalist sentiment in the provinces in the present democratic stage, as a reaction to the traditional centrism of the national government which reached a peak under the authoritarian government, makes it unthinkable that a development and environment policy could be successful unless the institutional mechanisms assure provincial participation in decision-making and decision-implementation.

Under the present Constitution, provincial participation in the national government only occurs in the Senate, and this is insufficient by any standard. For both planning and natural resources and environment most provinces

have specific administrative structures which, together with the highest political bodies, should be integrated in the institutional system.

f) The consolidation of democracy in Argentina is closely tied to its extension. The hyper-élitism characteristic of the authoritarian government and a more realistic evaluation of the causes of the failure of previous democratic phases have generated a tremendous will to participate throughout much of Argentinean society and intermediate associations, so that any merely "formal" conception of democracy is absolutely insufficient to legitimize decisions on major national objectives. Therefore, a creative effort is necessary to channel this will into agreements which provide for development planning –and the consequent incorporation of the environmental dimension in it– with possibilities for discussion between: i) the political-executive authorities and the national and provincial government members; ii) the technical administration establishment; iii) the political parties; iv) the production sectors; v) the trade unions; and vi) other intermediate associations (cultural, environmentalist, etc.).

Up to now, except for the tasks and responsibilities –described above– allocated at its inception to the National Secretariat for Planning, it is not known what planning system will be adopted in the future, although supposedly it will involve a National Plan binding on the public sector and only normative for the private sector.

On the basis of the premises described, we think however that an institutional model for development planning and environmental management which takes into account past failures in this area, so as to avoid them in the future, should follow the following outline.

First, it is obvious that adequate functioning of the Secretariat for Planning demands strong political backing at the highest level of the Executive Authority. This will depend not so much on the degree of willingness of this Authority to provide the support as on the ability of the Secretariat to harmonize sectoral and regional aspirations with the global objectives of the Plan and vice versa.

In this respect we believe that the country should be regionalized by grouping similar provinces, using the same criteria as in the past, and that each region should have a regional development council, made up of the governors of the provinces or their planning secretaries. These councils would be responsible for:

i) Proposing tentative regional plans expressing the aspirations of each region in the preparatory stages of the National Development Plan;

ii) Once the National Plan has been approved, establishing the objectives, policies and strategies for regional development in agreement with the Plan, and co-ordinating their respective provincial administrations for the implementation of the regional plans, with supervision and evaluation;

iii) In all cases, ensuring permanent consultation with the regional private sector.

A second level, between the regional development councils and the national government could be filled, with some adjustment its tasks and responsibilities, by the present Federal Investment Council. We think it should be given two very important responsibilities:

i) Acting as the first stage in harmonizing the proposals of the different regions in preparing the Plan;

ii) In designing and implementing regional plans the Secretariat for Planning should use the Federal Investment Council, where possible, for channelling technical and financial assistance.

This recommendation to incorporate the Federal Investment Council in the national planning system is based, on the one hand, on the federal structure it represents (it is the product of an interprovincial agreement and its highest governing body is an assembly of provincial governors) and, on the other, on its Technical Secretariat which, when given the opportunity, has shown high technical ability in regional development studies and projects.

It might also be useful to create small offices in each region, responsible to the Secretariat for Planning, to advise the regional councils and assure their smooth functioning with the Secretariat for Planning.

To assist the various agencies of the National Public Administration in sectoral planning, the Secretariat for Planning should constitute sectoral offices at the level of State Secretariat, with broad responsibilities for co-operating in the preparation of programmes and harmonizing them with the National Development Plan, as well as supervising its effective implementation. We know that, given the feudal tradition characteristic of all sectors of the Administration, this proposal is prickly and difficult to accept. However, the state of real emergency in the country and the need to ensure maximum economy of resources and a minimum dose of arbitrariness and sectoralism in State action fully justify it.

Lastly, we also think it will be necessary to constitute, under the Office of the President of the Secretariat for Planning, an advisory council made up of representatives from the private sector to discuss and co-ordinate the Plan before it is put before the President of the Republic for approval by the Cabinet and later before the Legislature to become law.

In the framework of this institutional model, we envisage the incorporation of the environmental dimension in development planning through the constitution of *multidisciplinary environmental technical teams*, in the areas for which the Secretariat for Planning is responsible, in the Technical Secretariats of the Regional Development Councils and in the Federal Investment Council, as well as in the sectoral offices in the various agencies of the Public Administration.

This should entail the dissolution of the present Subsecretariat for Environmental Regulation and the constitution, as an independent agency responsible to the Secretariat for Planning, of a National Environment Institute whose task would be to assist the Secretariat for Planning and all the

other regional and sectorial bodies mentioned above in the incorporation of the environmental dimension in plans and projects.

Its main responsibilities would be:

i) Within the framework of the National Development Plan, to draw up guidelines and norms related to the national environmental policy for global, regional and sectoral application;

ii) To assist regional and sectorial bodies in the preparation and implementation of the environmental aspects of projects, offering a consulting service for evaluating their environmental impact;

iii) To make a permanent inventory of natural resources and the state of the natural environment and human settlements, delimiting environmental regions and subregions with a view to proposing suitable guidelines, norms and management systems;

iv) To organize, update and co-ordinate a National System of Environmental Information to provide physical, economic, social and legal information about natural resources and the environment;

v) To propose guidelines and norms for the rational use of natural resources;

vi) To propose guidelines and norms for establishing areas requiring special protection, conservation, improvement or restoration and to administer the national protected areas (taking over from the present National Parks Administration);

vii) To propose and update a National Strategy for the Conservation of Nature;

viii) To propose and administer, when the activities concerned are susceptible of degrading the environment, a régime of "previous obligatory environmental declaration" and/or of "previous environmental authorization" applicable to the location, construction, transformation, or exploitation of establishments and installations, to the exploitation, transformation, ownership transport, or use of primary and processed materials, and, finally, to the adoption or modification of technologies or production processes.

ix) To collaborate with:

- The Ministry of the Interior in setting the environmental criteria for population policy and establishing the legal regulations governing interprovincial rivers;
- The Ministry of the Economy in inserting environmental criteria in the policies of agriculture, mines, marine resources, industry and regional development, and offering a consulting service for assessing environmental impact;
- The Ministry of Public Works and Services and the State corporations responsible to it in inserting environmental criteria in water, transport and energy policy and offering a consulting service for assessing environmental impact;

- The Ministry of Education and Justice in environmental education programmes for the formal educational system (Secretariat for Education), in creating a proper environmental awareness in the public (Secretariat for Culture), and in promoting environmental scientific and technological development (Secretariat for Science and Technology);
- The Ministry of Health and Welfare in environmental sanitation and urban development;
- The Ministry of Foreign Affairs and Religion in the technical environmental aspects of the country's international policy;
- The Secretariat for the Civil Service of the Office of the President in formulating criteria for the efficient and rational use of human resources in environmental management and, through the National Institute for Public Administration (INAP), in teaching and training the technical teams of the various Administration agencies in global, sectoral, regional and local environmental management;

x) To promote a greater public environmental awareness and institutional mechanisms for public participation in making, implementing, and regulating environmental policy;

xi) To prepare a Report on the State of the Environment in the country for the President to present every two years to the National Congress.

The existence of *multidisciplinary environmental technical teams* in the central agencies of the Secretariat for Planning, in its sectoral offices in the Regional Development Councils, and in the Federal Investment Council will constitute an authentic *functional and operational network* suitable for sectoral and regional application of the global guidelines and harmonizing development with the environment, as proposed by the National Institute for the Environment.

To persist, on the other hand, with the present cyst-like existence of an agency with global aspirations needs –like the Secretariat for the Environment– in the bosom of a sectoral agency –like the Ministry of Health and Welfare– would be a capricious absurdity which would make a mockery of any serious intention to incorporate the environmental dimension in Argentinean development planning.

BIBLIOGRAPHY

Argentina, Government of the Republic of (1977): *Report of the Republic of Argentina to the United Nations Water Conference*, Mar del Plata, Argentina.

Borlaug, N. (1983): "La batalla contra el hambre mundial", *Chacra y campo moderno*, Buenos Aires, August.

Brañes, B. R. (1979): *La legislación ambiental en América Latina: visión comparativa*, Interamerican Seminar on the Legal and Institutional Framework for Environment, Universidad Nacional de Educación a Distancia de Costa Rica/Centro Internacional de Formación en Ciencias Ambientales (CIFCA), San José, Costa Rica, November.

Brañes, B. R. (1982): "El derecho ambiental en América Latina", *Opiniones*, Ordenamiento jurídico series, No. 1, CIFCA.

——— (1984): "The juridical incorporation of the environmental dimension in development planning", in this same volume.

ECLAC/ILPES (1983): *Report submitted by the Rapporteur*, Fourth Conference of Ministers and Heads of Planning of Latin America and the Caribbean (E/CEPAL/Conf.4/L.7), Buenos Aires, May.

ECLAC/UNEP (1983): *Incorporación de la dimensión ambiental en la planificación*, Fourth Conference of Ministers and Heads of Planning of Latin America and the Caribbean (E/CEPAL/G.1242), Buenos Aires, April.

CIFCA (Centro Internacional de Información en Ciencias Ambientales) (1982): *Seminario sobre Medio Ambiente y Ordenamiento Jurídico*, final report, Mérida, Venezuela.

Echechuri, H. and others (1983): *Diez años después de Estocolmo*, Madrid: Ed., CIFCA. (See especially the chapters written by Enrique Iglesias and Vicente Sánchez.)

Gallopin, G. (1981): "El ambiente humano y la planificación ambiental", *Opiniones*, Madrid, CIFCA, Política y planificación ambiental series, No. 1.

——— (1983): *Documento de la Asociación Argentina de Ecología destinado a los partidos políticos de la República Argentina*. (Based on the sectoral technical reports of the work groups of the Association and discussion meetings), September.

Gligo, N. (1982): *Medio ambiente en la planificación latinoamericana: vías para una mayor incorporación* (E/CEPAL/ILPES/R.46), Santiago, Chile, 11 June.

Jocino de Aguilar, María E. (1984): "La experiencia de planificación en la República Argentina", Buenos Aires, January (*mimeo*).

Koolen, R. (1984): "Legislación y conservación de la naturaleza". Seminar on Nature Conservation, Federal Investment Council/National Parks Administration, Buenos Aires (*mimeo*).

Kugler, W. (1984): Conservación del suelo y del agua e inundaciones en la Cuenca de Mar del Plata", *Revista del Instituto Nacional de Tecnología Agropecuaria*, No. 40, Buenos Aires, June.

De Mattos, C. (1979): "Planes versus planificación en la experiencia latinoamericana", *CEPAL Review*, No. 8, Santiago, Chile.

Sejenovich, H. (1981): "Planificación y medio ambiente", *Opiniones*, Madrid, CIFCA, Política y planificación ambiental series, No. 3.

Sejenovich, H. and V. Sánchez (1978): *Notas sobre naturaleza, sociedad y la cuestión regional en América Latina*, Seminar on the Regional Problem in Latin America, Mexico, Colegio de México, doc. 1.2, April.

Sejenovich, H., Angel Maya and P. Gutman (1983): *Planificación y medio ambiente*, document prepared for UNEP/ORPALC, Mexico City.

Sunkel, O. (1981): *La dimensión ambiental en los estilos de desarrollo de América Latina* (E/CEPAL/G.1143), Santiago, Chile, July.

Sunkel, O. and N. Gligo (eds.) (1980): *Estilos de desarrollo y medio ambiente*, Lecture series No. 36, Mexico City, Fondo de Cultura Económica.

Toribio, A. and R. Koolen (1980): *Gestión ambiental en Argentina*, Buenos Aires, Ministry of Public Health and Environment.

Uribe, A., H. Echechuri and others (1981): Expert Seminar on Development and Environmental Planning, Doc. 9, Buenos Aires.

Valenzuela F. R. (1981): *Requerimientos para el desarrollo y la implementación de la legislación ambiental en la América Latina*, *ad hoc* meeting of High-Level Government Experts on Environmental Law, Montevideo, October-November.

III

THE LEGAL ASPECTS OF THE INCORPORATION OF THE ENVIRONMENTAL DIMENSION IN DEVELOPMENT PLANNING

by Raúl Brañes Ballesteros *

INTRODUCTION

The purpose of this study is to analyse from the legal viewpoint the incorporation of the environmental dimension in development planning in the Latin American context. The study does not include a consideration of the "institutional organization of the State", which could be considered a relevant legal-administrative issue, since it is treated in another chapter in this book (Koolen, 1985). Therefore, the following study is limited to questions of legal procedure related to the incorporation of the environmental dimension in development planning, with special attention to how it should be done.

The need to incorporate the environmental dimension in planning was one of the strongest recommendations of the United Nations Conference on the Human Environment (Stockholm, 1972) and at least seven of the 26 principles contained in the Declaration approved at that meeting refer to "the need for planning to avoid and resolve environmental problems" (Sánchez, 1983). The idea of incorporating the environmental dimension in planning is intimately related with development in this Declaration, as is clearly stated in Principle 14: "National planning is an indispensable tool for reconciling possible differences between development needs and the need to protect and improve the environment".

The appreciation of planning as an appropriate instrument for meeting the environmental challenge has given rise to a series of theoretical and practical concerns which, starting from the relationship between development and environment, have led to the establishment of some basic premises for

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the issue called "planning and environment" (Sejenovich, 1981; Gallopin, 1981; Gligo, 1981).

The result of this type of study is the concept of "environmental planning" which, in turn, has generated the concept of "incorporating the environmental dimension in development planning". The two terms are not synonymous. If it were necessary to establish a relationship between them it would be a relationship from the general to the specific. However, the truth is that these concepts are expressions of different categories. In fact, to move from "environmental planning" to "incorporating the environmental dimension in development planning" is to move from a conceptual category to an action category (or action proposal), since the first expression is used to designate the planning process which "includes the proposal and implementation of measures for improving the present and future quality of human life through the preservation and improvement of the environment both in its place-specific and non-place-specific aspects" (Gallopin, 1981), and the second is used, quite differently, to express a proposal which basically means, as has been pointed out by the ECLAC/UNEP Joint Unit on Development and Environment, "creating among planners, and in their planning methodology, the awareness and ability to consider natural resources and their ecosystemic characteristics as scarce and alternative use resources; expandable, reproduceable, capable of deteriorating and being exhausted, according to how they are treated; interrelated with each other and with human activities in many complex ways; whose use inevitably implies costs and benefits which affect the different social groups in various ways; whose costs may be minimized or even avoided, and whose benefits may be increased by appropriate environmental management; and where a thorough and creative, scientific and technological study may generate interesting opportunities for taking advantage of the environment for development purposes" (ECLAC, 1983).

This study refers to this type of proposal and attempts to throw light on how the environmental dimension in development planning should be incorporated in the law in Latin America. For this purpose the starting point is the idea that the proposal itself consists in "organizing a system and style of planning which defines concrete ways of really incorporating the environmental dimension and which use the current instruments of planning available as well as new developments in the area" (ECLAC, 1983). This means, from our point of view, the identification and resolution of legal questions posed in various ways by development planning, that is, an environmentally appropriate development planning, keeping in mind that the problem is "very different, in practice, from the creation of plans, programmes and projects on this subject" (ECLAC, 1983).

In fact, the incorporation of the environmental dimension in development planning is a proposal which supersedes the conception which could be called, obviously redundantly, "environmental planning proper", that is,

designing activities which make only environmental sense and which are usually expressed by planning actions whose sole objective is to recover or restore a specific degraded environmental system. Conversely, this proposal not only includes this type of planning, but also projects the idea of the environmental dimension towards the whole of development planning, proposing the need to consider this dimension over the length and breadth of the entire planning process.

A. QUESTIONS OF LAW RELATING TO THE INCORPORATION OF THE ENVIRONMENTAL DIMENSION IN DEVELOPMENT PLANNING

In principle, identifying and resolving the questions of law which are posed by the need for environmentally appropriate development planning takes as its point of reference what could be called *lege lata* or *lege ferenda*, within the legal framework of development planning itself. However, there is a second reference point which should also be taken into account. This consists of the legal framework for environmental protection and improvement whose provisions could also be relevant to this theme.

Obviously, if "incorporation" is taken to mean the action and effect of joining two or more things to form a whole, a self-contained body, then the incorporation of the environmental dimension in development planning must first be examined in the light of the existing relevant body of law to establish whether, by chance, the addition in question has in some way already been anticipated or, if not, how it should be done, depending on the characteristics of the body of planning law to which the environmental dimension is to be added.

This preliminary analysis of *lege lata* shows that, with some exceptions, the idea of incorporating the environmental dimension in planning is not yet established in law in Latin American countries. Moreover, in the few countries where this idea is to some extent in force, it can only be spoken of as a "beginning" of incorporating the environmental dimension in development planning, since only general provisions exist on the subject. Moreover, these provisions are usually included in environmental legislation rather than in planning legislation.

Consequently, the analysis which must be made is rather of *lege ferenda*, starting from existing planning legislation. The difficulty of this analysis is that, as a general rule, Latin American countries do not have sufficiently specific planning legislation for making a concrete juridical proposal for incorporating the environmental dimension in development planning. Certainly, almost all the countries of the region have some planning legislation, but most frequently it is limited to the organic, administrative aspects. Usually, in fact, what could be called the legal framework of planning

is concerned with creating administrative agencies for planning and not with regulating the planning process as such.

The above is related to what ILPES has assessed as "one of the greatest problems facing planning in Latin America", that is, "the lack of persistence, typically expressed in the lack of continuity of the planning process after the plan formulation stage, for the process usually slows down as the plan is carried out and evaluated, till it is ultimately abandoned".[1] This situation is explained, among other reasons, by the lack of an appropriate legal framework for the planning process: even the obligation of periodic planning is not always sufficiently explicit.

The truth is that planning appeared as and has remained in Latin America an eminently discretional state activity, i.e., not governed by rules. The legal provisions establishing the administrative planning agencies are generally limited to this, despite the fact that a series of legal norms scattered through other legal dispositions refer, directly or indirectly, to the plans as guiding instruments for government action, but without further specification. Planning in Latin America suffers serious deficiencies in contrast to the complexity apparent in the abundant legislation on State intervention in the economy.

A non-exhaustive statement of the legal deficiencies of development planning in Latin America, shows that the planning issues still pending are basically the following:

– The incorporation of development planning at the constitutional level, as part of the role of the State as a corollary of the principle of State direction of the economy. This point tends not to be clear in many political constitutions.

– The definition of the planning objectives, also at the constitutional level, to provide a broad general outline of the national project to be implemented through planning.

– The location of the planning function, also at the constitutional level, in one of the existing government agencies (generally at the national or local level, or at both).

– The decision at the constitutional level as to how the various political powers making up a specific level of government are to participate in the planning function. This means establishing how the legislative and executive authorities are to participate in this function.

– The introduction of direct public participation in the planning function, in agreement with the basic principle of democratic planning.

– The structuring of a planning system which allows the smooth participation of the various actors in the planning process (for example, a national development planning system).

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[1] See the technical documents prepared by ILPES for the Fourth Conference of Ministers and Heads of Planning of Latin America and the Caribbean, Buenos Aires, 9 and 10 May, 1983.

– The establishment of a procedure which lays down the form in which the planning process will unfold: formulation, implementation, supervision, development and review of the plans, as well as their content and other characteristics.

– The relationship of the planning process with the budgetary process; here it must be remembered that this last is a State activity which is generally perfectly clearly defined both by the constitution and by other laws.

– The design of the necessary legal mechanisms for carrying out the plans, including not only the establishment of the binding power of its provisions over State agencies and the regulation of future agreements between the State and individuals (with their legal consequences) but also the subordination to planning goals of the right of the State to interfere in the economy and/or the creation of new rights, where necessary.

The lack of an adequate legal framework for development planning in many Latin American countries is the result of fundamental factors which have been studied before and which have resulted in anomalous situations, clearly demonstrating that the Latin American State has not assumed a legal commitment to planning (Brañes, 1984). Although this situation is changing,[2] often the proposal legally to incorporate the environmental dimension in development planning must be included in a more general proposal to regulate the planning process. Where there is no such regulation, it will still be possible to incorporate the environmental dimension in development planning *ee facto*, as has been happening, although "incipiently", in some of the countries of the region. This is possible because of the eminently discretional character of development planning in Latin America.

The same analysis of *lege ferenda*, this time taking environmental legislation as the starting point, presents another kind of difficulty. In fact, environmental legislation should be taken as the axis for incorporating the environmental dimension in development planning, since what this incorporation should reflect, in substance, is the underlying criteria of environmental policy in this legislation. Nevertheless, as with the planning legislation, the environmental legislation is only incipient, if only that legislation reflecting a holistic and systemic concept of the environment is defined as environmental legislation. Few countries in Latin America have legislation of this nature. As a result, the incorporation of the environmental dimension in development planning lacks, from the legal viewpoint, the substantive elements –the holistic and systemic environmental policies to be implemented through the planning process. Until these policies exist,

[2] This is the case in Mexico where articles 25, 26 and 73 of the Political Constitution were reformed in 1983 and a Planning Law came into effect, providing a suitable legal framework for development planning, a State practice begun in Mexico in the 1930s. For this purpose reforms were also introduced to the 1976 Organic Law of the Federal Public Administration which conferred new rights on the Programming and Budgeting Secretariat which was created that year.

incorporation will be subordinated to sectoral environmental policies expressed in the relevant norms and/or to the discretionary decisions of the planning process itself.

All the above suggests that the incorporation of the environmental dimension in development planning poses legal questions which relate not only to planning legislation but also to environmental legislation. Consequently, the legal tasks facing the incorporation exercise are related to both types of legislation and therefore must be dealt with jointly. Moreover, the problem becomes even more complex when it is taken into account that the incorporation itself takes place in a context of rectifying capitalist institutions and it thus enters into contradiction with the "general spirit" of the whole capitalist legal system and will require a profound change in the foundations of this system (Brañes, 1985).

B. HOW TO INCORPORATE THE ENVIRONMENTAL DIMENSION IN DEVELOPMENT PLANNING

The non-existence in many countries of planning legislation which is sufficiently specific on the subject makes it impossible to study the legal incorporation of the environmental dimension in development planning except by starting with a legal model for the planning process which must be constructed as a framework for examining how to legally incorporate the environmental dimension.

For this purpose we will assume that the model is made up of a legal system for economic and social development planning, with several legal subsystems for planning specific matters, such as urban development planning. The first will be conventionally called "general legal system" and the others "special legal systems".

It can be assumed that the general legal system will have to include some basic premises such as the following:

- The duty of the State to plan development as a function of the control it exercises over economic and social life as a whole;
- The frameworks within which the State exercises its planning function, which will probably depend on the general legal arrangement of the State, since this indicates its right to interfere in the economic and social life of the country in question;
- The objectives guiding the planning activity, also probably dependent on the same legal arrangement, assuming that this includes a "national project" or projected social model to which planning must be subordinated;
- The forms to be taken by the State planning activity; and
- The effects the plans will have on State activity and society as a whole.

These basic premises will have to be sufficiently specific about:

– Determining the competent agencies for planning and specifying their functions;

– Establishing the planning process in stages of formulation, implementation, monitoring evaluation and review;

– This process must include an indication of what kinds of plans should be formulated. In this respect the system will have to consider, at least, the existence of global, sectoral, and regional plans as well as others which may appear necessary, defining their content and time-space horizons;

– Also, the system will have to consider how these plans will be implemented through more specific programmes and projects as well as their relationships with the State budget; and

– The system will have to require specifically that the various outputs of the planning process are coherent among themselves, and it may have to establish an order of priority among them.

This outline suffices to suggest how the general aspects of the environmental dimension can be legally incorporated in development planning. In fact, for this incorporation to be operational it is obvious that, in the first place, the environmental dimension must be incorporated in the objectives of the development planning and, if this is done, in the definition of development contained in the general legal system as well, for ultimately it will be these objectives –which are the expression of the underlying national project– that will guide the whole of the planning activity. However, it also follows that, in the second place, the environmental dimension should be reflected as faithfully as possible in the more important details of the general legal system, particularly in those concerning regulation of the content of the plans, so that planners are legally bound to take the environment into account in all kinds of plans.

It must be stressed that the legal incorporation of the environmental dimension in development planning has to be considered at all existing levels within the general legal system (global, sectoral, regional, etc.). This means that its incorporation cannot be limited to a specific level of planning as would be the case of global planning, since this would constitute only a "beginning of incorporation". Neither can it be limited to sectoral planning or regional planning which are usually especially favoured as tools for protecting and improving the environment (Gligo, 1982). As has been pointed out, the problem to be solved is very different from the business of generating plans, projects and programmes for the environment from a specific sector, often created *ad hoc*. It consists essentially in transmitting an environmental view to the entire planning process. This will certainly be very difficult at the level of global planning, because global conceptions of the environment are themselves insufficient, and even more difficult to integrate in development theory. However, it will be seen as a necessary requirement from a legal viewpoint when it is remembered that the other types of planning will be subordinated to global planning, as in any system which produces duly

consistent and harmonious planning output. It is also true that environmental problems will not be resolved in national development plans, because of the abstract nature of such plans. However, the same can be said of all plans –national, sectoral, regional, *ad hoc*, etc.– where the actions anticipated in the plans are not sufficiently clearly specified in concrete projects, which should also be legally required to take the environmental dimension into account. Even so, there still remains the problem of the possible gap between project norms and actual practice.

Everything that has been said is applicable to the problem of how to legally incorporate the environmental dimension in development planning. However, it relates to a supposedly general legal system for planning which may possibly already be complemented by other planning subsystems. Human settlements planning is a clear illustration, for this type of planning is usually regulated separately from economic and social development planning, generally by urban development laws (which are planning laws). Consequently the question of how the environmental dimension can be legally incorporated in planning is nowhere near answered by its consideration at the level of the general legal system for planning. Therefore, it will be the particular characteristics of each legal subsystem for planning that will indicate how the environmental dimension can be legally incorporated in this subsystem. However, these particular characteristics will not generally require more complicated incorporation criteria than those mentioned above for the general legal system for planning.

C. THE PROGRESS MADE IN STATUTE LAW IN LATIN AMERICA

The issue of incorporating the environmental dimension in development planning is not at all foreign to national legal codes in Latin America, despite existing shortcomings both in planning legislation and in environmental legislation proper. As a matter of fact, for some time a relationship between planning and environment has been developing in the legal field. This represents a real beginning to the incorporation of the environmental dimension in law, at least for global planning. Some cases of legal regulation in Latin America, where this relationship does exist, for example in Colombia, Venezuela, Brazil, Cuba, Costa Rica, and Mexico, will be presented below.

As might be expected, this relationship has usually been established in environmental legislation rather than in planning legislation. In fact, the environmental legislation that began to appear in Latin America in 1972, legislation based on a holistic and systemic conception of the environment, has shown a clear tendency to relate planning to the environment by including among its provisions some regulations relating to this problem (UNEP/ORPALC, 1984).

For example, the Colombian National Code on Renewable Natural Resources and Environmental Protection (1975) contains several provisions relating planning to environment, such as the one which states that "plans and programmes for environmental protection and renewable-resource management should be integrated in the general plans and programmes for economic and social development in such a way that the relevant problems can be studied from a common standpoint and joint solutions sought, subject to a scale of priorities for applying policies concerning ecological management and the use of two or more competing resources or competition among various uses of the same resource" (quoted from article 45, (d)).

The Organic Environmental Law of Venezuela (1976) envisages a National Plan for the Conservation, Protection and Improvement of the Environment that "will form part of the National Plan" and indicates the necessary content for this Plan (article 7). This provision was recently complemented by the Organic Law for Land-Use Planning (1983), which develops one of the points to be included in the Plan, namely, "land-use planning". The latter law exhaustively regulates the various plans that would form the basic implements for land-use planning: the National Land-Use Plan, the Regional Land-Use Plans, the Sectoral Plans, the Plans for the Development of Areas subject to Special Administration Systems, and the Plans for Urban Land Use. It is interesting to note that this type of planning is explicitly considered part of development planning. In fact, article 8 of the Law provides that "land-use planning is part of the process of planning the integral development of the country, and therefore all land-use planning activities should be subject to the norms of the National Planning System, once they are established".

Brazil's Law 6938 of 31 August 1981 on the National Environmental Policy also refers to environmental planning. This Law, in defining the basic objective of the national environment policy, directs that it must be carried out in accordance with the principle, among others, of "planning and controlling the use of environmental resources" (article 2, subsection I). In another article the same Law lists the specific objectives of the national environment policy, particularly emphasizing "making economic and social development compatible with the preservation of environmental quality and ecological balance" (article 4, subsection I). However, nowhere does the Law legally incorporate the environmental dimension in development planning in the sense in which this concept is used, but only relates development planning and environment. Furthermore, the same Law implies a type of environmental planning independent of development planning when in article 5 it provides that "the guidelines for the National Environment Policy will be formulated through norms and plans to guide the actions of the Government of the Union, the States, the Federal District, the Territories and the Municipalities, for the preservation of environmental quality and the maintenance of ecological balance, in accordance with the principles

established in article 2 of this Law". The recent Regulations of the Law make no change in the situation, but only state that in carrying out the national environmental policy the various levels of government are responsible for "maintaining permanent control of environmental resources, seeking to harmonize economic development with protection of the environment and ecological balance" (article 1 of the Regulations of 1 June 1983).

Obviously, in Cuba the relationship between planning and environment is defined by planning, as is proper in a country where the centrally controlled economic system ensures integrated planning. Hence Law 33 on Environmental Protection and the Rational Use of Natural Resources (1981) simply reflects this in norms such as the one which provides that the protection of the environment consists, among other things, in "its planned conservation or transformation" (quoted from article 7 (a)), or the one which provides that "the necessary financial resources for applying the measures for environmental protection and the rational use of natural resources are expressly included in the State Plan for Economic and Social Development and are carried out accordingly, with priority given to those issues most closely linked to the economic, social and cultural development of the country" (article 8).

The situation is similar in Costa Rica, where the relationship between planning and environment is also established in the planning legislation. On the basis of the National Planning Law (1974) of Costa Rica, a decree issued in 1981 created the National System for the Protection and Improvement of the Environment as an integral part of the System for National Planning and Economic Policy, with the basic purpose of "defining, promoting and coordinating the national policy for the protection and improvement of the environment" (article 1). This decree establishes a National Council for the Protection and Improvement of the Environment, one of whose functions is to "review, integrate and harmonize policies, priorities and strategies which are dispersed among several institutions and which the country must adhere to for the protection and improvement of the environment, in accordance with the National Development Plan and within the specific guidelines issued by the Office of the President of the Republic, through the Minister-Director of the National Planning and Economic Policy Office" (quoted from article 5, (c)).

The case of Mexico is somewhat more complicated. In fact the country has modern planning legislation (Planning Law published in the *Diario Oficial* of 5 January 1983) and also modern environmental legislation (Federal Law on Environmental Protection, published in the *Diario Oficial* of 11 January 1982). However, although each of these laws defines its main field of action

(planning and environment respectively),[3] in fact neither of them attempts to establish a clear relationship between planning and environment. However, the Planning Law contains, in our opinion, a norm which represents at least a beginning of the incorporation of the environmental dimension in development planning regulated by the Law itself. We refer to article 2 of this Law which provides that "planning should be carried out as a means of the effective discharge of the State's responsibility for the integrated development of the country", adding that it "should contribute to attaining the political, social, cultural and economic goals and objectives stated in the Political Constitution of the United Mexican States". The same Law proceeds to define these objectives, which include "attention to the basic needs of the population and improvement of all aspects of the quality of life" (subsection III). If attention to the basic needs of the population and, above all, improvement of the quality of life in all aspects is language indicating the environmental issue, it must be concluded that the Law is referring to this issue through this language and is thus making environmental improvement a planning objective. On the other hand, the Mexican Federal Law for the Protection of the Environment does not establish a relationship between planning and environment, at least not in the same terms as the other environmental laws referred to above, i.e., between development planning and environment. The Law only indicates planning criteria; for example that the responsible Federal Executive Offices, within their areas of competence, must "study, plan, programme, evaluate and rank the projects or studies on urban development, national parks, fishing reserves, industrial and work zones, and zoning in general" (article 6), but it does not link this type of planning to development planning. All this suggests that, in very general terms, the environmental dimension is legally incorporated in development planning in Mexico by means of the definition of its objectives. This is important because, as already said, it is these objectives that determine all State planning activity at all government levels (national, sectoral, regional, etc.). The question is whether this is enough.

[3] National development planning is defined in the Planning Law (only for the effects of this Law) as "the rational and systematic regulating of actions which, founded on the exercise of the Federal Executive right to regulate and promote economic, social, political, and cultural activity, with the purpose of changing the state of the nation, in accordance with the norms, principles and objectives established by the Constitution and the Law (first paragraph of article 3). ... the federal Law for the Protection of the Environment defines the environment (also only for the effects of this law) as "the set of natural, artificial or man-made, physical, chemical, and biological elements which favours the existence, change, and development of living organisms" (article 4).

D. ENVIRONMENTAL PLANNING PRACTICE IN LATIN AMERICA

The degree of discretion of the existing legal planning systems in most Latin American countries has meant, paradoxically, that in some cases the environmental dimension has been incorporated *de facto* in development plans. The paradox is that the very lack of a defined legal framework for planning has facilitated this incorporation from a formal viewpoint, since development plans do not generally have legally predefined objectives or content which could be taken to mean that environmental matters are excluded from planning. However, the foreseeable tightening of definitions in legal planning systems will require those countries when legislating on planning to consider this incorporation explicitly, because otherwise it could be understood that environmental matters are excluded from the planning process.

ILPES drew attention to the incorporation of the environmental dimension in development plans around 1980 when it commented that "the concept is slowly gaining ground in the countries of the region that the environment is a global dimension within which natural processes are harmonized with economic and social processes. Moreover, environmental matters are considered an indispensable factor for the achievement of totally integrated development". However, ILPES added, "the techniques for incorporating this dimension in development plans are in a beginning stage and require a great deal of research. It is understandable, therefore, that this dimension does not explicitly appear in development plans". In the end, ILPES took it upon itself to point out that "in spite of this, it cannot be said that environmental considerations have been ignored in development policies and plans. They have been taken into consideration in some areas (energy, natural resources, land use, pollution and human settlements) but only as specific measures and without a global focus related to development" (ILPES, 1982). Some concrete cases can illustrate this, but without indicating the possible effectiveness of such planning.

In Brazil, for example, the Third National Development Plan 1980-1985[4] States that in all aspects of national development policy and its implementation emphasis must be put on preserving the country's historical, artistic and cultural heritage and natural resources, as well as on preventing, controlling and combating pollution in all forms. In this plan, the environmental dimension is considered as a separate topic in the chapter, "Other government policies".

Perhaps Venezuela is a special case in that its legislation, as has been mentioned, envisages a National Environment Plan as part of the National

[4] The Third Plan was preceded by the Second National Development Plan 1975-1979 and by the First National Development Plan 1972-1974 which also include environmental considerations.

Development Plan. There still is no such environment plan. Nevertheless, the various Venezuelan national development plans have introduced environmental considerations. For instance, the current Sixth National Plan 1981-1985 [5] includes global policies for renewable natural resources and new and renewable energy sources and for the improvement of the quality of life in human settlements, to mention only a few of its many environmental aspects. It should be pointed out that the country has been making a big effort to devise methodology for satisfactorily incorporating the environmental dimension in development planning.[6]

In Mexico, the National Development Plan 1983-1988 has three main parts. The first establishes policy principles, the diagnosis, the purpose, the objectives and the strategy; the second, the implementation of the strategy; and the third, public participation in the implementation of the Plan. The environmental theme is present in the Plan from the beginning, especially in the description of the strategy, where it is given a special paragraph ("5.3.5.3. To preserve the environment and to reinforce the development potential of natural resources"). Among other things, it says here that "the strategy of the Plan gives specific weight to the environmental criterion" and it is spelled out that this criterion "is to be explicitly introduced in project programming". Accordingly, the second part, on implementing the strategy, includes an "ecological" policy among the social policies ("7.7. Ecology"). The inclusion of this policy in the Plan is justified by the significant statement that "the environment is simultaneously a result of the development process and a prerequisite for its occurrence". There follows a diagnosis and a statement of the purposes of the Plan in this respect, and on this basis specific strategy lines are formulated. These are divided into corrective and preventive. The former include controlling and reducing environmental pollution and restoring the ecology in degraded areas; the latter include a series of items ranging from differentiated and specific policies for managing natural resources to requirements for completion of the legislation with new legal provisions and incorporation of the environmental principle in the development programmes. Finally, as a general action programme, a series of measures is described, with the following basic activities: prevention and control of environmental, water, woods and soil and air pollution, ecological restoration, restocking of wild animals and plants, and the conservation and enrichment of renewable natural resources.

It is important to note that the provisions of the decree which approved the National Development Plan[7] include the drafting of a Medium-Term

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[5] Venezuela has had national development plans since 1960 (1960-1962; 1963-1966; 1965-1968; 1970-1974; 1976-1980, are the periods covering the five plans preceding the present Sixth Plan).

[6] We refer to the project VEN/79/001, Venezuelan Environmental Systems.

[7] See article 15 of the decree published in the *Diario Oficial*, 31 May, 1983.

Programme and its corresponding Annual Operational Plan for Ecology, which would be the responsibility of the Secretariat for Urban Development and Ecology, without prejudice to the activities of other agencies dealing with environmental questions (such as health, under the Secretariat for Public Health and Welfare; urban development and housing, under the Secretariat for Urban Development and Ecology; integrated rural development, and water, woods and forests, under the Secretariat for Agriculture and Water Resources; fisheries and marine resources, under the Secretariat for Fisheries, etc.).

Most of these programmes came into effect in the second half of 1984, including the one subsequently called the National Ecology Programme 1984-1988. The basic characteristics of this Programme are:

i) the objectives established are both corrective and preventive; ii) the strategy is related to the ecological regulation of land use, the prevention and control of environmental pollution, regional conservation, preservation and restoration of the environment, the exploitation and enrichment of the natural resources for their integrated management, and environmental education; iii) the Programme is concentrated in 11 strategic projects to be carried out between 1984 and 1988; and iv) the Programme recognizes that the environmental issue is intersectoral and proposes co-ordinated action among the different agencies and units of the Federal Public Administration, and among the State and Municipal Governments and the public and private sectors.

The type of environmental planning described so far is certainly exceptional in Latin America. The possibility of its gaining in depth and breadth in a desirable way and, above all, with the degree of effectiveness necessary for generating environmental change depends on many factors. This study has looked at only one formal aspect of incorporating the environmental dimension in development planning, the legal aspect, which is a necessary enough prerequisite (given that such incorporation can also take place in a discretional planning system), but in no respect is it sufficient.

E. TIMELINESS AND SENSE OF THE INCORPORATION OF THE ENVIRONMENTAL DIMENSION IN DEVELOPMENT PLANNING

A legal proposal such as this is timely and makes sense if the proposal to incorporate the environmental dimension in development planning is also timely and makes sense.

It is thus impossible not to mention the questioning of the timeliness and sense of incorporating the environmental dimension in development, based on the criticism of its viability and, more profoundly, of the viability of development itself, especially in the context of the present world economic

crisis. In fact, this crisis has put in abeyance, for what it appears will be a prolonged period, the possibility of overcoming the underdevelopment and dependence of the Latin American economies. A retrospective view of the vicissitudes of the Latin American economies from the end of the Second World War to the outbreak of the present crisis suggests that in this period saw Latin America no development as such, but only growth with poverty which in the end frustrated expectations of real development. Finally, throughout this entire period planning had no influence whatsoever on economic and social processes, since the development plans were without exception not carried out.

Therefore, it would seem legitimate to ask the question –which could be put forward as a methodological doubt were it not necessary for other reasons– of the purpose of incorporating the environmental dimension in development planning. Apparently, there is no reason for thinking that development planning could become a suitable instrument of environmental change because, historically, it has not even been an instrument of the social change implicit or explicit in the prevailing concept of development in Latin America; thus it could hardly be the instrument of environmental change, which is definitely a specific form of social change. Consequently, to postulate the incorporation of the environmental dimension in development planning would seem somewhat untimely and senseless. On the other hand, the very idea of development does not seem viable given the magnitude of the world economic crisis and the current financial restrictions on promotion of development projects. We should recall, as ILPES does, that the present world economic crisis has closed the period which started soon after the end of the Second World War when the Latin American growth rate averaged 6% a year. The 1980 per capita product can probably not be restored until 1990 and this will require a rationalization effort to harmonize adjustment policies with development policies. In practice, however, the short-term misadjustments are jeopardizing the development process (ILPES, 1985).

Nevertheless, these same facts lead us to think that the proposal to incorporate the environmental dimension in development planning is now more timely and makes more sense than ever.

We say that because this is not an isolated proposal to improve a given situation, but a criticism of the prevailing approach to production which is seriously compromising the quality of life of present and future generations and even the very idea of life. In our region, as has already happened elsewhere, it can be predicted that this criticism will secure a high degree of acceptance and social mobilization and will become a dynamic idea which by itself, or in conjunction with other dynamic ideas, will drive forward a process of social change.

For this reason, it does not appear to us that the proposal to incorporate the environmental dimension in development planning, as has been said more than once, is a recommendation limited to promoting a technocratic utopia to

be added to those already created within development planning itself. This is true if it is understood as a proposal directed only to the technocracy. However, the recommendation should be taken as a proposal to the whole of society. It is part of a wider framework criticizing development and the more or less conventional theories of development from the environmentalist viewpoint.

This criticism proposes ecodevelopment, i.e., the substitution of traditional production criteria with ecoproduction criteria; in the capitalist sphere it is a proposal to modify the production logic of the maximization of profit in the short term in favour of the logic of rational exploitation of environmental resources. Looked at in this way, the proposal is political; in other words, it is in the interest of the *polis* as a whole (so far as development is concerned) and forms part of the "concrete utopia" of a national project.

Development planning should not be thought of only as a space created by the technocracy (which is not true either) where historically expectations have failed, but as a political space which is yet to be created and within which a different development model will be regulated and basic economic decisions will be made democratically. In this sense the planning which has formally existed in Latin America does not constitute a reference framework which can be used for the proposal of incorporating the environmental dimension. This requires not only a different development model, but also a different planning style. By the expression "planning style" we are not referring only to planning techniques, which certainly should be modified, but also to the set of ideas and practices within which the style has developed. These techniques should be considered part of the set because, as pointed out by the ECLAC/UNEP Joint Unit, "the planning methodology usually followed in Latin America took little note of the previous (environmental) considerations largely because, like the development strategies themselves, it was very much influenced by a style based fundamentally on an imitation of the development patterns of the industrialized countries" (ILPES, 1985). In fact, these techniques were designed essentially to add, as pointed out in a well-known work (ECLAC, 1955), "greater strength and regularity to the growth of a country", without taking into account the effects of this growth on the natural foundation of development.

Placed in the correct perspective, it is undeniable that the proposal to incorporate the environmental dimension in development planning makes a kind of sense which legitimizes what is said and done about it. However, it is also an eminently timely proposal. The very economic crisis and the resulting adjustment policies are making it daily more difficult for the countries of the region to achieve environmentally appropriate development.

As always happens, the short term seems to be irreversibly compromising the long term. The proposal to incorporate the environmental dimension in development planning seeks to reverse this tendency in time through a profound modification of planning processes which favour the short term at

the expense of the long term. For as it has been well put,"the future begins today".

BIBLIOGRAPHY

Brañes, R. (1984): "Estado, derecho y planeación", Mexico City (*mimeo).*

_____ (1985): El manejo integrado de los recursos naturales frente al derecho, in Enrique Leff (ed.), *La articulación de las ciencias*, Mexico City, Siglo XXI Editores (in press).

ECLAC (Economic Commission for Latin America and the Caribbean) (1950): *Third Session* (Provisional Agenda), Montevideo, Uruguay (E/CN.12/163).

_____ (1983): Incorporación de la dimensión ambiental en la planificación (E/CEPAL/G.1242), *Fourth Conference of Ministers and Heads of Planning of Latin America and the Caribbean*, 28 April.

Gallopin, G. (1982): "El ambiente humano y la planificación ambiental", *Opiniones*, Madrid, Centro Internacional de Formación en Ciencias Ambientales (CIFCA).

Gligo, N. (1982a): "Medio ambiente y planificación: las estrategias políticas a corto y mediano plazo", *Opiniones*, *ibid*.

_____ (1982b): *Medio ambiente en la planificación latinoamericana: vías para una mayor incorporación*, E/CEPAL/ILPES/R.46, 11 June.

ILPES (Latin American Institute for Economic and Social Planning) (1982): *El estado actual de la planificación en América Latina y el Caribe*, Cuadernos del ILPES series, No. 28, Santiago, Chile. (Presented at the Third Conference of Ministers and Heads of Planning of Latin America and the Caribbean, Guatemala City, 6-9 November, 1980.)

_____ (1985): *Report of the Fifth Conference of Ministers and Heads of Planning of Latin America and the Caribbean* (LC/IP/G.26), Mexico City, April.

Koolen, R. (1985): *Institutional organization of the State for the incorporation of the environment in development planning* (LC/R.420(Sem.25/13)), ECLAC, Santiago, Chile.

UNEP/ORPALC (1984): *Legislación ambiental en América Latina y el Caribe*, Documents series No. 2, Mexico City.

Sánchez, V. (1983): "La problemática del medio ambiente y la planificación", Mexico City, El Colegio de México. (Work documents.)

Sejenovich, H. (1982): Planificación y medio ambiente, *Opiniones, op. cit.*

PART THREE

INSTRUMENTS AND METHODS FOR INCORPORATING THE ENVIRONMENTAL DIMENSION

I

ENVIRONMENTAL IMPACT ASSESSMENT AS A METHOD OF INCORPORATING THE ENVIRONMENT INTO PLANNING*

by José Leal**

SUMMARY

The developed countries have evolved a series of methods and techniques for measuring the impact of development plans, programmes and projects on the environment. Among these, the Environmental Impact Assessments (EIA) consists of a set of tools which are sufficiently developed as to be widely used and commonplace, particularly in dealing with the more traditional environmental problems: pollution, despoliation and conservation, which are precisely the priorities of the industrialized world.

Without a doubt, in Latin America the most tragic environmental problems are different: marginality and poverty, deforestation, erosion, and irrational use of resources. However, the region's traditional environmental problems have magnitudes which are often more serious than those of the developed world, such as pollution levels in cities, the destruction of cultural heritage and the disappearance of native species. Thus, there is great potential for applying EIA techniques, once they are adapted to the Latin American situation.

This document offers a defence of the possibilities of applying EIA within the framework of the development planning process and presents some of the most frequently used concepts and practices as a first step in adapting them to the region's environmental problems.

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INTRODUCTION

Environmental Impact Assessments (EIA) first appeared in the industrialized countries, especially in the United States, as a methodological tool for attempting to quantify systematically the effects of human activities on the quality of environment.

Quality of environment generally refers to a component of *quality of life* in general, the decline of which is one of the outcomes of environmental deterioration, both in cities which are becoming increasingly polluted, and in agriculture which is progressively threatened by industrial activity, irrational land use and the indiscriminate use of elements designed to increase its productivity: machinery, fertilizers and pesticides. Previously, "the environment" as such did not exist; i.e., it was not known by that name since one only spoke of nature, the natural world or physical surroundings. Then something different happened: nature began to be visibly degraded and human beings, still in some way attached to the major natural cycles, began to react. That is why "he environment" was transformed, like it or not, into a rallying banner and into an additional cause of conflict between classes and interests. The concept seemed the typical expression of a strictly contemporary issue; it was developed and expanded and it began to make demands on the scientific and technological community. A large body of literature began to appear on the subject (Munn, 1979).

Paradoxically, EIA received a major boost and expansion from scientific activity connected with military hardware and warfare. The result was so positive from the viewpoint of its objectives, that the destruction of ecosystems by war is considered to be one of the greatest ecological disasters of human history (Robinson, 1979). One might add that a particularly ominous manifestation of warfare is its contribution to desertification, as the above-cited document points out. Generally speaking, environmental deterioration can always be associated with military activity, owing both to wars, with the destruction of specific ecosystems, and to the arms race, which consumes enormous amounts of natural and human resources, apart from the potential risks involved in the current massive build-up of highly destructive weapons.

Utilization of this already proven method for "peaceful purposes" became increasingly widespread in the United States, and the central government gradually took charge of environmental problems, taking appropriate institutional steps to promote expansion of a broad range of pure and applied research on the subject and influencing the growth of public awareness of the problem. Public movements and conservationist and environmental groups stimulated this trend and even exercised their lobbying power –which grew increasingly formidable– to seek solutions, especially with regard to *quality of life* and *respect for nature*. At the same time, although in less obvious fashion, the industrial and financial sectors saw the danger which

deterioration and depletion of certain strategic resources –another aspect of the environmental issue– represented for their interests. Contributions came from all quarters to form a powerful school of thought, which brought about major changes in North American society (Portney, 1978). It even left its mark on literature, particularly poetry, which picked up the yearning for the America of yore and denounced its decomposition and decay.

In reality what was involved was an attempt to find ways of minimizing the negative consequences of the development process and, caricaturing the situation, of "excessive" development. Awareness of environmental deterioration and its relation to certain crucial factors of development began to spread, owing especially to the consequences of economic growth which had a direct impact on this deterioration, such as for example demographic growth and the growth of cities, as well as the pressure on agricultural land, industrial technology which generated ever increasing amounts of harmful by-products, human health problems connected particularly with pollution, greater exploitation of native resources and their subsequent depletion, etc.

It is worth mentioning that a whole school of thought developed in the industrial world from the concept of "demographic explosion", in particular in the impoverished Third World. This ideology still holds sway and constitutes one of the most retrograde views of the environmental issue, almost bordering on racism. But it is without doubt, consistent with the objectives of the most powerful sectors of the industrialized capitalist world (Lader, 1971).

Thus the disjunction between environmental protection and economic growth met head-on. Simply by application of the laws of physics the concern gained a solid basis: an equation which establishes greater production of goods and services also implies greater production of "evils and disservices" in the form of slag, liquid and gaseous emissions, refuse, industrial wastes, smoke, etc., in addition to more intensive use of natural resources. On the other hand, increased welfare as a result of growth brought about heavy pressure on recreational and leisure facilities, such as beaches, green areas, areas of natural beauty, historical monuments etc., which contributed to their deterioration. Development had its disadvantages which had to be minimized. Political mechanisms and methodological tools were needed for this purpose.

The social demand for action to check or diminish this process and the unquestionable success obtained in certain areas, in addition to the relative social consensus which sustained it, were undoubted achievements of the democratic system of government in the United States –insofar as popular sentiment influenced national decision-making. Enormous public pressure forced environmental issues to be given priority, even to this day, despite the political changes in that country, giving rise to strong legislation and environmental institutions. This included for many activities mandatory, rigorous and scientific studies on environmental impact assessments (EIA) –a continuing requirement– and consequent environmental impact statements

(EIS), public reports which provide an opportunity for critical evaluation of the environmental consequences of a major activity which would affect a significant number of community members (airports, industrial projects, national parks, highways, etc.). The broadest information has to be made available as to the effects, thus allowing those affected to voice their opinions.

North American society in its opulence was widely concerned with quality of life and European countries were quick to follow suit; their tradition of resource protection enabled them to take up this trend very enthusiastically. The idea was that nothing was gained by achieving increasingly higher individual standards of living –measured essentially by greater consumption capacity– if collective life deteriorated to such an extent as to offset the benefits of the abundance achieved. In any case, consumption as such was never questioned, although it is a major source of pollution. On the other hand, concern for the environment has not always extended to the remotest and most inaccessible natural resources –an approach maintained in international forums, especially by the industrialized countries. They have tended to reduce the environmental issue to one of pollution, thus neglecting the interrelationship between the capacity to absorb wastes and residues and the environment's supply of resources.

In Latin America the tendency has been to question this attitude, or rather this mode of action to establish an environmental policy. The argument is strong: the developing countries' problem is not exactly excessive development but rather lack of current development and the bleak future prospects. Problems typical of underdevelopment such as marginality –the underutilization of human resources– and the indiscriminate exploitation of natural resources are precisely the greatest problems which can be classed as "environmental" in Latin America and which, at first glance, have little if anything to do with the other problems described above, which are peculiar to the developed world.

In the final analysis, and in its most positive aspect, Latin American environmental doctrine has taken the form, with some slight variations, of a profound criticism and rejection of the theory of "comparative advantages", the banner of the region's powerful conservative schools of thought. Such comparative advantages in the end are nothing more than the exploitation of cheap labour and abundant raw materials, thus substantially aggravating the environmental problems of our countries. Greater poverty and despoliation of the national heritage are not exactly the strongest of bases for achieving the high and widespread levels of social welfare of Northern countries, including those of Eastern Europe. It may be asserted that what is in crisis is a world behaviour model based on the irresponsible use of resources and attacks on the environment, added to the mirage of cheap energy based on oil. In this connection, and although we digress beyond the scope of this work, it is necessary to back the current efforts to establish a new international economic order which would permit countries to defend their national

heritage, including the environment, against aggression of the multinational kind.

These views, which are widely shared by the region's thinkers, undoubtedly contain important elements for a correct diagnosis, emphasizing what is most tragic about the Latin American crisis, environmental or otherwise.

This position, nevertheless, has tended to underrate other environmental problems characteristic of the developed world which may be cleansed the stigma of being caused by "excessive development", being presented instead as anomalies of development. They may well be assessed in the light of the seriousness of their consequences and the exponential way in which they are manifesting themselves. For example, pollution has been systematically viewed as a minor or irrelevant problem in the region. The concern which many governments have expressed about this situation has been described as a smoke screen to conceal basic problems and offer some kind of reply to the in-vogue concern for the environment. Something akin to the "flower pot" agrarian reforms of yesteryear. Even at the level of ideological paradigms, the revolutionary environmentalist position of many groups in Europe and the United States –which have even achieved political expression– has become the hobbyhorse of reactionary governments, strongly influenced by minority social classes which have made the concerns of the central countries their own in a typical aping attitude. In this respect the military dictatorships have been particularly loquacious and inept.

The origin of this trend is quite clear. To begin with, the problems of air pollution and their repercussions on health, the degradation of coastal areas or overcrowding in cities have produced a corresponding reaction among the privileged classes which is reflected in government actions, campaigns in the various mass media –especially in the media given preference in the conservative plan of things, such as television– mobilization of volunteers –especially young people and students– and conservation programmes for certain endangered species, etc. Generally, however, none of this has produced a real solution to the environmental problems, or even a good diagnosis. Higher-income groups ultimately prefer to move to unpolluted areas, leaving the urban hell to the middle- and lower-income sectors, obtaining new land for settlement at the expense of forests, mountains or agricultural land. All of this instead of dealing with urban reform and protecting forest and farming areas, for instance. So-called "real estate speculation" boosted by these removals, which is so characteristic of the recent conservative régimes in the region, is seen in a different light when analysed from an environmental point of view. Its consequences are often tragic: destruction of coastal ecosystems (and in passing, degradation of the landscape), floods, felling of forests, occupation of agricultural land, erosion, etc. Thus, the pollution problem greatly exceeds mere concern on the part of privileged social classes. The health issue alone would be sufficient cause for

concern in terms of the influence of the environment on many apparently natural diseases (Eckholm, 1977).

Moreover, despite appearances to the contrary, the levels of environmental deterioration in the world today are worse in the Third World than in the developed world. Processes such as desertification, deforestation and the depletion of renewable resources, to name only the most important, are advancing at an absolutely tragic rate in our countries. There is evidence that Europe and (to a lesser extent) the United States are winning the battle against the first two scourges, and that they are taking extreme care with the third. This is particularly the case with their astute policy of conservation of their own resources and exploitation of those same resources of the periphery, leaving the Third World a scant surplus which contributes little to its development. We seem to pride ourselves on the steady despoliation of our habitat.

The extinction of native species is another phenomenon whose most visible expression is currently found precisely in the Third World. The argument that the extermination of species in the industrial world did not prevent it from growing and developing and that it was precisely those extinct species which contributed to its wealth is not a valid one for at least two reasons: Third World species are a biological reserve for mankind as a whole, which it is important to preserve in order to maintain the planet's ecological balance; moreover, the Third World has a right to count on these species to contribute to its own development, subject to their adequate protection. This is the case with tropical ecosystems, with regard both to biome and to habitat, which are seriously threatened by expansion and artificialization policies that are gradually destroying them.

Air pollution is the scapegoat of progressive environmentalists of all hues in our countries. The general trend is to deeply underrate the problem, comparing it –in a false disjunction– with the major problems of underdevelopment: poverty, health, housing, the external debt, etc. This must be mistaken, for the pollution of the air, the earth and water supplies is in reality not only extremely serious in our countries but also, in the majority of cases, much worse than in the developed world. For instance, urban air pollution caused by internal combustion vehicles (termed mobile sources in pollution jargon) has been controlled to a large extent in cities such as London, Rome and Brussels, and is in the process of being improved through concrete actions and programmes in Prague, Athens and other cities in Central and Eastern Europe. Mexico City, São Paulo, Santiago or Caracas are worse in this respect than any major city in the United States, as recent statistics show (GEMS, 1977-1978). According to this report, daily average levels of suspended particles (measured in microgrammes per cubic metre) during that period reached 171.2 in Santiago and 89.1 in São Paulo, while in Chicago, New York and Montreal the levels were 85.9, 18.7 and 68.2

respectively. The levels in London and Brussels were only 23.8 and 22.8 respectively.

Deforestation is one of the major problems in Latin America and throughout the entire Third World, owing, among other reasons, to the energy needs of the poor, which are met by the indiscriminate use of wood for fuel, but above all to the speculative logging of forests, including native forests of species on the verge of extinction, invoking the argument of "comparative advantages", which is the ideological last resort of conservative régimes, as was mentioned above, and on the theoretical basis of free enterprise at any price which is so in vogue in many countries. According to the Global Report 2000, by the end of the second millennium the countries of Latin America will have lost 40% of their forests, the majority of which are tropical (*El mundo*..., 1980).

The entire Latin American region is threatened by desertification of immeasurable proportions, whose more visible effects can be seen in northern Chile, in the Bogotá savannah and in north-eastern Brazil. As is well known, desertification is an irreversible process of environmental degradation, which has been aggravated in our region by successive droughts and other natural disasters.

In recent decades pollution has taken qualitative leaps in its pernicious effects on the environment. The appearance of at least two major groups of pollutants, radioactive substances and synthetic organic pesticides, in addition to the increasingly frequent and little-known phenomena of synergism, mean that the issue cannot be reduced to the problem of smoke from smokestacks. The Third World is coming to play a part in the worst of world contamination through the transfer of technology and polluting processes. Tragic examples, such as the recent events in Mexico and India, are merely the most striking and visible expressions of permanent risk situations.

Other forms of soil contamination by pesticides or industrial effluents are also having an enormous impact, aggravated by indiscriminate transfer of technology and polluting processes from the centre to the periphery, which has been further boosted by restrictive legislation in the developed countries, in contrast to broad permissiveness in our countries. These transfers are increasingly important and they seem to be in an upward trend, stimulated by the open-hands policies towards foreign capital promoted by conservative economic models. However, there has been some slowing down of this process as a result of the current international recession, although this does not rule out intention to continue in this direction.

Unfortunately the Third World has gladly embraced the current trend in world capitalism for irrational use of its own resources –despite the alarm signals from the Club of Rome– exacerbating two of its most degraded features: consumerism and the arms race. Undoubtedly, the historical pillage of Latin America is to a large extent at the root of the environmental

problems currently plaguing the region (Galeano, 1974). Dependence in all its forms, from colonialism to the current neocolonialism and imperialism, has been responsible for the destruction of ecosystems, the degradation of local culture and the proletarianization of the native inhabitants. The stripping of forests in the exploitation of resources is a classic example: the extraction of minerals in Bolivia, Chile and Peru can be credited with the transformation into deserts of enormous areas once featured in the chronicles as great forests or arable land. This is not to mention the genocide committed by forcing indigenous populations to work as slaves in the mines, causing them to lose their ancestral methods of agricultural and livestock production and abandon their settlements, which were often surprising examples of harmonious coexistence with the natural environment.

The available contemporary examples are also overwhelming: the need for pasturelands to produce the hamburger meat consumed in the United States has caused the destruction of millions of hectares of farmland in Central America; the legacy left by British companies was the disappearance of the pine forests from the Atlantic coast of Nicaragua; and 10% of the destruction of Brazil's native forests is thanks to the transnational corporations installed there (Toledo, 1983).

Desertification and deforestation are not the only serious and pressing environmental problems facing the region. Mention must be made of the indiscriminate artificialization of land and the short-term economic advantages of monoculture, whether of rubber, cocoa, bananas or sugar. This aspect of the environmental issue is far from being well understood and is rarely featured in government initiatives. Some authors have been deeply concerned with this indisputably priority problem (Gligo, 1981). In any case, the agricultural issue is closely linked to environmental issues as a whole; the ideal and utopian solution would involve a vision –comprehensive, integrated, holistic or whatever– which, is totally lacking in the Latin American region.

Let us clearly state that despite the troubled rhetoric and the creation of sometimes gigantic institutional apparatuses for dealing with the environment –whose specialists perform a commendable but frustrating task– real concern about the problem on the part of many governments has been rather doubtful. The frequent campaigns against air pollution in cities or to protect forests or green areas, or to stop the indiscriminate dumping of industrial and urban wastes into rivers and lakes have meant little or nothing in terms of impact on these situations. The environmental issue, imported as an ideological ploy from the industrialized countries to the periphery, has been little more than the smoke screen referred to by its detractors.

However, real problems do exist and will continue to exist as development, especially in industry and agriculture, continues to expand and urban concentration remains its most dynamic expression. There is a very large gap between the reality of the problem, its neutralization at the official level and the possibilities of reducing or overcoming it. Not only pollution

problems but also the other environmental problems of the developed world are found –sometimes in an exaggerated form– in our countries. It is not for nothing that Latin America holds several records in this respect. According to the above-cited GEMS report, the maximum level of suspended particles in Santiago during the period analysed reached 1 826 microgrammes per cubic millimetre, the highest in the 17 countries sampled, with the exception of Warsaw, and even exceeding Houston, which is considered to be one of the most polluted cities in the United States.

Now more than ever, as some authors put it "we have our ecology and they have theirs" –a dichotomy between the official view and rhetoric on the problem and its sometimes dreadful reality, which is merely a reflection of the evils of underdevelopment (Gorz and Bosquet, 1978). At bottom, the environmental problems peculiar to underdevelopment are the unjust distribution of income, massive unemployment and underemployment among large groups of the population, together with the marginalization of certain sectors such as the Indian population, poverty and disease. In addition, these problems coexist and are closely connected with the effects of modernization and the import of the transnational development styles. One could argue, without denying their importance, that in any case these are merely marginal problems in the Latin American region. However, in reality, although they are classified as problems peculiar to or characteristic of the industrialized countries, we have them at higher levels than in those countries and in many cases we are almost completely lacking in minimum environmental protection legislation.

Against this backdrop the perspective is one of gradual deterioration of the environmental situation in Latin America. There is no doubt that in this respect the negative effects of imported development styles have outweighed their advantages. The system tends to foster a dearth of environmental quality and resources –above all energy resources, more strategic and coveted by the centre– and a deterioration in the quality of life, which in turn gives rise to greater inequalities. It is not only that the poor live in the belts of poverty surrounding the big cities, without access to modern infrastructure, but also that they must suffer the most degraded of environments, which they help to make worse. These types of "reserves" of subhuman life, like it or not, have been typical epiphenomena of Latin American "development of underdevelopment". The transformation of our cities into uninhabitable places, abandoned by the wealthy classes in favour or clean peripheral areas (be it Valle de los Chillos in Quito, La Molina in Lima or Lo Curro in Santiago), has meant a drastic increase in inequality, in terms which are never quantified in income indexes; this in addition to the actual expropriation by élites of space suitable for other uses, either farming or recreation, or for creating "green lungs" for the city. Thus, growth has only increased inequality through the unjust distribution of the environment and has synergistically increased the disadvantages of development.

This position may be described as out of tune with the more dominant position in Latin American thinking and is frequently accused of tending towards technocratism. Still, while accepting the priority which other problems may have in our societies, we believe that issues "characteristic" of world environmentalism are just as pressing as the others and warrant attention. In addition we believe that there are long-term benefits to be gained from overcoming these problems which are difficult to envisage at present. Moreover, as we hope to demonstrate below, the costs of many actions are perfectly bearable, even in the midst of the present crisis and even taking advantage of it, if we may say so.

In any event, it should be pointed out that the two positions mentioned –if in fact there is a dichotomy between them– tend to overlap to the extent that they share the objective of improving the population's quality of life by combating marginality, and of promoting the reasonable use of resources by combating their inevitable depletion. In essence there is not a sharp schism between the two views of the Latin American environmental issue. For example, it is agreed that consumerism is merely a degeneration of the economic process, which has been warmly embraced by our élites and the masses which follow them, although consumerism at the lower levels is merely a wishful-thinking illusion. This situation became more acute under the authoritarian régimes which have made it one of their preferred mechanisms for winning support and perpetuating themselves. With these mechanisms, which are based on a phenomenon of alienation fueled by deluded compensation, especially self-compensation in a system which fosters individualism, the tendency is for citizens –driven by advertizing, easy credit ("fast cash") and the urge to get ahead and be upwardly mobile– to assume conservative positions, even protofascist ones, which consolidate the dictatorships. However, the precarious nature of this political practice is clear: it can make these régimes "last" for a certain period, but sooner or later they will fall, leaving in their wake countries which are economically, socially, environmentally and morally bankrupt.

Simply put, consumerism does not satisfy basic human needs and amounts to fetishism of the useless, the superfluous and the unnecessary. But it has proven highly lucrative for those who profit from it as owners of the means of production and distribution. The privileged classes enjoy the goods to which developed countries have access and transmit their values to the dispossessed in a terrible confusion of priorities which even transcends the instinct for survival. Thus we do not eat or dress ourselves but we do have coloured television sets. Lastly, consumerism implies wasting resources without people living at all better: it is the most degraded form of the squandering of resources, disguised as well-being.

In our societies the consumerism of the élites is without doubt one of the major generators of environmental deterioration. And not only because of its intrinsic misuse of resources, but also because it is a major source of all types

of waste products and even pollutants. In various cities, for example, many of which are awakening from the colonial dream, the onslaught of the automobile civilization has been such that it is practically impossible to escape its noxious effects. The old city of Quito, declared a "cultural heritage of mankind" by UNESCO, is today a noisy, airless place, whose monuments are already suffering visible deterioration due, to a large extent, to traffic congestion so severe –and for which the city was never prepared– that rhetorical solutions are quite out of the question. The city of Santiago, whose air pollution problem, according to official scientific reports (using mainly climatic arguments), is "impossible" to solve, exhibits all sorts of urban planning absurdities, such as an underutilized subway system which runs in parallel with thousands of buses whose exhaust emissions are totally uncontrolled, despite the semblance of control required for obtaining a vehicle licence. In both cases the solution calls for a total reformulation of traffic flows, regardless of short-term "political" considerations; this requires a genuine will to solve the problem within the perfectly feasible medium term. The most honest explanation, which relates this situation to the economic interests of small politically influential groups, which do not exactly constitute the professional classes but rather small transportation firms or drivers' co-operatives operating mostly at subsistence levels, is unfortunately not valid over the long term. In that term we all lose, one way or another. These are not answers to the problems of urban degradation but rather to the meanness of short-sighted and predatory régimes seeking to hang on at any cost.

The wastefulness at all levels is thus consistent with the consumerist style of development, which is transnational in origin and basically imitative and dependent. What is most unfortunate is that all this is happening despite the fact that science actually has the answers to the problem. Without a doubt, the solution lies in a process which produces decisions compatible with this scientific progress and which facilitates the use of accumulated knowledge. More than mere "awareness" of the environmental problem –another ideological constant of the system, which as a rule lacks real content– it is a matter of fighting against an education system –formal and informal– which fosters consumerist patterns. It is an education designed not for knowledge but for alienation, especially from nature, a moderate lifestyle and the search for knowledge. Official statements breed irresponsibility towards resources by using false arguments preaching efficacy and optimization in economic terms; and this doubtlessly overcomes weak arguments, in favour of their measured use, designed for popular consumption.

Thus, viewed from the perspective that under certain conditions it is possible to deal with environmental problems and that there are ways for doing so, the following chapters will analyse part of the battery of tools available for producing assessment studies and statements of the effects and impacts of programmes, activities or projects on the environment. We shall take it that these introductory remarks have somehow placed the problem in

its proper perspective; in other words, that given a social disposition to act, EIAs and EISs are useful tools, but they are not in themselves solutions to anything.

What is important is to direct environmental protection activities, primarily towards the objectives of national independence and self-sufficiency, and not to view them as mere safeguards of the dominant style which naturally protects itself against the harmful effects of environmental deterioration for its own survival. Despite this, as the example of the Northern countries shows, it is possible to follow some of these lines of action to protect the environment in our countries. The search for alternative development styles is necessarily passing through the phase of starting-up activities within the dominant style. And one of these activities is to profit from experience in the methodological sphere.

A. ENVIRONMENTAL IMPACT ASSESSMENT

Once it is accepted that Latin American environmental problems are essentially the same as those of the industrialized world, in terms of the effects of the development style, our working hypothesis is that the application of EIA methods and techniques, or at least their consideration as available tools for dealing with environmental problems, is perfectly feasible. Moreover, they may be very valuable in dealing with certain specific and very pressing problems, where the objective conditions for solutions exist.

In general terms, EIA is an in-depth study of the effects and impacts of specific human activities on the environment. As such it performs a primary key function which is to identify the specific activities which affect an equally specific environment (or part of it). Not all human activities, in fact, have a significant effect or impact on the environment (positive or negative), but the most influential social activities generally do.

This is not an insignificant undertaking since, on the one hand, it requires a conception of environment which includes the idea of the part of the environment receiving the effect or impact, and ultimately the identification of the affected part. On the other hand, it requires the plan, programme or project to contain the necessary information for estimating as nearly as possible its total emissions into the environment; this must include, among other things, the total amount of products and by-products generated, from goods and services to smoke and slag, those which have a real price and those which do not, total elements taken from the environment in the form of raw materials, energy resources, land, air space etc., including those that have a value and those that are unpriced or free. General project elements such as location, financial flows or expected results also provide important information when analysed from an environmental point of view. A programme or project totally devoid of environmental considerations could

be transformed into a long list of questions in the hands of a conscientious and prepared environmental analyst.

By synthesizing various contributions from the literature, we can define the environment as a complex and sensitive system in which a human being installs himself to live– building human settlements– from which he obtains the necessary elements –material and energy resources– for satisfying his physical and spiritual needs, and into which he discharges the waste products from his everyday activities (Pearce, 1976). This is no doubt a somewhat broad definition but it is not at all ambiguous. It attempts to encompass the main aspects of the modern meaning of environment, which is ultimately the basic human life-support system.

Thus, the environment is first a system, which means that it has well-defined limits and a performance subject to standard laws. If these limits are set by ecological laws, which are those governing the behaviour of natural systems, including the living beings who live within these limits, then we have an ecosystem: a system in which certain groups of living beings make use of a certain physical environment. In dealing with our environment, therefore, we proceed to select a physical geographical area, including its atmosphere, lithosphere; and hydrosphere, in other words, a specific "chunk" of the biosphere. There is also of course the national environment of a country, which is a more complex system and which includes various subsystems. The natural ecosystem, governed by ecological laws, is superimposed on what is called the socioeconomic system, created by man, which substantially transforms this natural system into a built and artificial one.

This system performs certain functions. In the first place, it provides *resources*. Resources, consisting of *materials* or *energy*, are either *renewable* or *non-renewable*, and are *available* or *unavailable*. No concept of the environment which omits this first and essential basic function can make sense as an explanation of the complexity of the systems on which we are based. Man both dumps wastes into the environment –land, air or water– and removes elements from it. Why are we concerned about the air being polluted? Because we breathe it and need it to continue living. If it is polluted, our life expectancy is reduced and our chances of contracting certain diseases increase. To give a classic example, it has been demonstrated by several unquestionably serious studies that there is at least, a correlation between certain kinds of lung disease, including cancer, and various forms of air pollution, including cigarette smoke (Lave and Seskin, 1970).

The second function of the environment is to receive our waste products. Pollution is ultimately no more than the exceeding of the environment's capacity to receive, assimilate and transform these waste products into new resources. Thus, the assimilation capacity is a kind of renewable resource and, like all renewable resources, exhaustible. Perhaps this is not true of the atmosphere or oceans –although the issue is open to question– but a lake can be permanently lost through eutrophication or a zone may become a desert,

reclaimable in theory, but only over a span of several centuries. Latin America's ecological history is full of tragic examples of this kind (Gligo and Morello, 1980).

Moreover man, unlike most animal species, is sedentary and tends to group together in large communities. For this reason he needs special mechanisms for getting rid of his refuse, since otherwise he would drown in it. This role is ultimately played by the environment in that it receives and absorbs human wastes up to the limits of its capacity. Thus, as separate and combined receiving agents, air, water and earth should be viewed as scarce resources, for the enormous quantities of waste products produced by man exceed this absorption capacity right from the start.

Thirdly, if we speak of spiritual development, then the aesthetic quality (visual, auditory and sensory in general) of the environment –specifically, landscape and cultural heritage– plays a particularly important role. For some people, and here subjective elements come strongly into play, this could have a very high value and pollution; for example, could mean more in terms of urban deterioration (as in the case of Santiago), or the destruction of traditional architecture (the case of Quito) or the dangerousness of extremely chaotic traffic (the case of Caracas), or the disappearance of green areas (the case of Lima), or crime and overcrowding (the case of Rio de Janeiro), etc., than in terms of health problems or depletion of the ozone layer, which are other effects of air pollution. The incorporation of these intangible environmental elements is a major contribution by traditional environmentalism which should not be underestimated.

What is clear is the interrelation between all these elements. It is impossible to separate one function from another without completely distorting the multiplicity of effects which each one has in conjunction with the others on the overall environment as a complex system. One way of depicting these interrelations is to balance matter and energy in a system composed of two major systems, the environment and the socioeconomic system, in which each environmental function is interrelated with the socioeconomic system. In actual practice all these functions are inseparable, hence many of the difficulties encountered in environmental policies, which arbitrarily separate them for operational purposes. It is worth mentioning that, unlike in traditional balances, *recycling* is included as a special activity. This is possible only insofar as certain material resources can be reused by conversion into useful elements for the human life process. In this respect modern science has made great strides, which would in theory permit the recovery of a large number of elements in the future (Allen, 1980).

These balances identify the sources of environmental deterioration (or negative effects/impacts) in both production and consumption activities and therefore any environmental policy would require action on both. Likewise, both activities make demands on the environment in terms of resources. It seems evident, then, that the *resources-production-consumption* cycle does not

end with consumption, as traditionally maintained in economic theory, but instead extends to the generation of waste products at each of these levels and in all processes, with the corresponding environmental consequences. Consumption is no longer the endpoint, the objective of economic activity. The energy-materials balance reveals that a large volume of elements remain physically in being after the consumption process has been completed. They must return to the environment, taking up part of its absorption capacity and eventually polluting it when this capacity is exceeded. In general, these waste products have no expression in the traditional economic process and they are not reflected in the market, although it should be noted that progress has been made in this respect in developed countries.

Furthermore, greater quantitative use of resources ultimately means greater production of goods, but also of evils extending to all environments receiving or absorbing wastes, whether natural or man-made while at the same time they are the supports of all the resources available in nature. This is fundamental in designing EIA studies, in the sense that partial assessments must be based on a clear idea of the study's systemic limits, if the whole set of interrelations is to be respected. It would be advisable for the study to indicate at least the lines of force of the interrelations with other environmental functions.

At another and more dramatic level –to take up the thorny issue of energy resources– we cannot deal with oil, which is scarce, depletable over a finite period, inaccessible and highly polluting, in the same way we would, say, hydroelectric power. Both are energy resources but very different in nature. So-called alternative energy sources, today once again forgotten, such as solar, wind or thermal energy and biogas, maintain their potential and are conceptually very different from other sources (Lovins, 1977) (ECLAC, 1983). Likewise, unlike energy resources, all material resources are in theory recyclable, even if this recycling is possible only at the cost of enormous energy subsidies and the use, in turn, of greater resources. Recycling poses different challenges in terms of environmental impact, which is difficult to forecast because of the interrelations.

Every EIA should therefore propose a different and specific treatment for each resource involved, lest it fall into gross oversimplification, which would totally distort the problem. An adequate classification of resources may help to clarify this matter.

The concept of development as a process in which the natural environment is transformed into a man-made and artificial one is an original way of approaching certain problems from a different angle, problems chewed over *ad infinitum* in the debate on the relationship between development and environment (Sunkel, 1981). It is a step forward from the old amorphous conceptual dichotomy of nature on one side and society on the other. The interrelationships between environmental functions require us to approach the resource issue by attempting to differentiate between them in

their interrelations with other elements of the environmental system and within a broader spatial conceptual framework, which extends beyond the environment strictly involved in the activity.

There is also a fundamental time dimension, namely, the long term. This is precisely what characterizes those environmental impacts which are hardest to identify, assess or quantify and predict, i.e., that many of them only manifest themselves over the long term. From this it could also be inferred that future generations are being irreversibly deprived of the enjoyment of those resources affected by environmental deterioration. This is an ethical question seldom touched on by "serious" environmental studies but now taken up by many conservationist groups. In other words, there is no reason for us to leave our successors a legacy of disaster caused by our immediate appetites if we can prevent it.

The long-term horizon invests the environmental system with two additional characteristics which render it even more complex: it is a system which is both *dynamic* and *uncertain*. The problem of uncertainty is one of the most critical in environmental management sciences. Uncertainty is reflected in two dimensions: the information available lacks definition in terms of the probability associated with its own values; i.e., those values should be real at a given moment in time; and the available forecasts of effects are hardly reliable, precisely because of their long-term dimension, because of the synergism associated with these processes and because of the interrelationships themselves.

Uncertainty theory deals with this problem in a surprisingly simple way: if information is deficient owing to lack of scientific progress and research on the subject or because of the insufficient actual availability of data series (the case of underdevelopment), or because of the very long time horizon involved (the case of the environment), then improved information must be paid for. This improvement can occur at two levels: raising the scientific quality of the information itself or manipulating the information with techniques for handling uncertainty.

It is virtually impossible to avoid the need to treat environmental data as if they were highly uncertain, and this makes their manipulation more complex. There are some methods available, scientific and reliable to a greater or lesser degree, which make it possible to work with uncertain data. In any case, the simplistic assumption that data are deterministic and fixed is a source of gross error in the assessment of impacts and effects. Thus, one constant factor of EIA is the uncertainty coefficients associated with the study at all levels. This does not mean that data or forecasts are invalid or useless, but rather that this difficulty must always be kept in mind. For the rest, it is precisely this characteristic which has throughout history invested the environmental issue with a serious time-lag and made us suffer the consequences of errors committed perhaps centuries ago.

B. THE OBJECTIVE OF ENVIRONMENTAL IMPACT ASSESSMENT

There are various criteria for developing an EIA study. First of all, with regard to the environment involved, an initial differentiation must be made in terms of its dimensions, facets or functions. All subsequent criteria must be based on this. In a nutshell, there will be impacts on *resources* (material and energy), impacts on the *capacity to absorb waste products* (pollution), impacts on *recreation facilities, landscape and cultural heritage* and *multiple* impacts (combinations of the above).

1. Impact on resources

This case is governed by a criterion of logic and rationality concerned with the survival of the set of human beings occupying a specific environment. It is basically a matter of asking whether the use of the available resources at the global or regional level in an activity is justified, particularly in the case of non-renewable or scarce resources.

There are few economic elements which can in themselves independently guide this decision. *Non-renewable* resources will be depleted sooner or later, depending on their use and development possibilities. Although we are not dealing with a fatalistic and static situation, it is evident that they are destined for depletion over the long term. There is the alternative of reusing or recycling material resources, in qualified and specific cases, but no alternative for energy resources which are non-renewable. Logic, backed by science, indicates that the possible alternatives are: i) to conserve them; ii) to develop substitutes; and iii) to seek more efficient uses. Each resource will naturally have a different weighting, depending on its importance for the national or local economy, its strategic nature, geopolitical considerations, etc. Thus, there are no identical impacts for a given resource located in different countries or regions or for different resources within a given area.

Renewable resources should be protected in order to maintain their reproductive capacity and avoid their depletion. In reality, many of them have already disappeared from the face of the earth owing to overutilization. The fact that they are renewable does not mean that they are inexhaustible. Despoliation, irrational use, indiscriminate exploitation or any other qualifier merely indicates insane behaviour whose explanation lies in short-term interests, in violence between classes and countries, or in the irresponsibility of the human race.

In other words, to logic is added ethics, both between species and between generations. Here the analysis should aim at identifying the resources which will be affected and at evaluating and projecting their supply during and after the implementation and operation of the project.

2. Impact on absorption capacity

The second case is essentially based on biology and what it teaches us regarding the capability of the earth's receptive mechanisms to receive discharges which form no part of their own way of operating and exceed their capacity to absorb them. A hunting and gathering society is not the same as a large modern city in terms of emissions. Ecology has coined a set of specialized terms such as carrying capacity, resilience and productivity, which are indicators for measuring this function of the environment. Absorption capacity may in fact refer to a renewable resource of great potential but which can be depleted when its natural power is exceeded, especially in the presence of man-made substances with which a specific natural environment is unable to cope.

3. Impact on recreation facilities, landscape and cultural heritage

In the third case the criteria are essentially aesthetic and subjective in nature and constitute a key element in man's spiritual life and a key variable for quality of life. These aesthetic elements constitute a whole which in turn encompasses the natural environment (landscape) and the man-made environment (cultural heritage). In this area the value attached to these elements is highly subjective and thus this subjectivity may be open to all sorts of manipulation to steer it towards certain interests, a fact which has jeopardized environmental quality. Advertising, subliminal desires, obsession with progress, upward mobility, the mystique of technology, etc., are some of these forms of manipulation. What is important is that through environmental education this subjectivity can be reoriented towards protection of the environment and habitat.

These impacts are the most difficult to quantify, since they involve an enormous number of intangibles and immeasurables. Nevertheless, there are things which can be done in this area, and it is vital that they are done, otherwise a great number of components of welfare and quality of life will be left out, as impacts not taken into account.

4. Multiple impacts

These impacts –very complex in themselves– may be handled to some extent by using material balances which "track" a given product as a user of various inputs provided by the environment. This analysis is also useful to avoid double counting which could lead to errors.

This is the more general framework for preparing an EIA, and it will underlie this study throughout. No complete EIA can avoid this multidimensional character of the environmental issue –this trinity whose whole is greater than the sum of its parts. The largest of schemes proposed must be broken down for operational purposes, identifying the more

traditional criteria which differentiate between impacts, for instance, according to the *receptor environment* directly affected. This criterion may, in fact be superimposed on the impact criterion of *type of emission* (solid, liquid, gas, energy), starting from the basis that each type of emission can occur in each receptor environment (air, earth, water).

Each time these emissions exceed the absorption capacity of the environment(s) (individually or as a whole) *pollution* occurs (of water, air or earth).

C. THE ENVIRONMENTAL IMPACT PROCESS

In any discussion of methods of environmental impact assessment, the first need is to clarify the steps leading to the impact. Each stage, in fact, involves very different types of analysis and the fact that they are consecutive means that the environmental analysis of each stage is a prerequisite for the next one.

1. *Action*. Action means any human activity (plan, programme, project or operation) which, in one way or another, produces an important change in the environment. At this point, a prior distinction must be made: it is necessary to decide which projects (generically speaking) will be considered. It is obvious that it is not possible to make an in-depth environmental impact study of all of them. And the studies may be very different in scope, depending on the seriousness and urgency of the problem. There are certain activities whose possible effects are very clear in terms of the substantial changes they imply for the physical environment: building a road, logging a forest, constructing a dam or a pesticide factory. But this is not the case with other activities, of smaller scope in terms of land use; for example, tourist development of a region, construction of a power plant, or a pest-control programme, whose effects are not so easy to envisage. There are others that simply appear totally innocuous from the point of view of altering the environment; for example, creating an ecological reserve or a cultural landmark, legislation on the use of certain spaces or energy resources or a housing plan. They are not in fact innocuous and impact studies can describe the true dimensions of the consequences of these activities apparently lacking negative environmental impact.

Before expanding on what has been stated above, it would be useful to point out that the concept of *action*, in itself, is totally devoid of environmental connotations, unless it specifically refers to actions tending to alter the environment in a positive way. In this case EIA would be warranted only to give notice as to the variety of positive effects and impacts, while possible negative impacts would be given under other headings, such as social, political or economic.

There is a first level of actions which is connected with national development plans and their breakdown into sectoral and regional plans. At this level it is only possible to establish in very general terms the potential effects of specific aspects of the plan and the repercussions on the whole of the national territory and its regions or sectors, in the case of national and regional plans. Here comparison with a previous plan would appear to be a useful way of highlighting relative changes which the new plan would mean in use of the territory. Without getting into how plans should be prepared so as to incorporate the environment and without looking into the region's various planning categories, mere consideration of the environment –given that it is a dimension which cuts horizontally across all sectors– could shed light on the implementation of an environmental plan, which means first of all identifying the plan's effects on the environment –in all its functions– and establishing certain criteria for its subsequent breakdown. Of course we are not referring to a plan in the formal sense, but rather to the *consolidation* of environmental considerations emerging from the various sectoral and regional levels of the planning system.

In any event, an environmental plan is an absurd concept if, as is usually the case, the environment is viewed as a separate sector within the socioeconomic structure. Yet environmental planning may be an effective aid to an environmentally concerned development process, since it is an aggregate of the environmental components of the national plan and its constituent parts. Thus, in principle an environmental plan would be in a position to recommend the preparation of more or less detailed impact studies of activities recommended in national, regional or sectoral plans for specific regions or sectors.

This indirectly leads to the question of what would the true scope of a national plan have to be in order to encompass all the activities of a country, or at least to consider them within its framework. Many dimensions of the environmental problem may be disregarded in a country's planning process, which will depend on the degree of development of the planning system and the agencies concerned with environmental issues and natural resources. Thus *indicative* planning contains only recommendations for the private sector –which may be more or less weak– while *normative* planning, as the name implies, establishes strict norms and regulations for this sector. What both these extremes of the planning continuum have in common, at least in theory, is the incorporation of the private sector, which is important, if only in general terms and primarily in the industrial and agricultural sectors, with regard to the use of a common environment for which they must compete. In either case, environmental action should be consistent with the nature of the national plan. If it is merely indicative with respect to private sector decisions affecting certain general objectives such as jobs, income distribution, self-sufficiency or food, it will also be so with respect to standards of environmental quality.

In any event, the existence of a national plan, regardless of its level, is what guarantees, in principle, that all areas of national life which in some way use the natural and man-made environment will in fact be taken into account.

All these general plans, in turn, translate into plans and programmes for sectors, areas, zones, subregions, watersheds, etc., which means breakdown into greater detail and certainly in the majority of cases, into specific actions which will materially affect specific environments. In this case, the EIA content will be more extensive, especially in terms of helping to establish sectoral and regional policies, which are objectively the most effective, provided that they are taken seriously and enjoy adequate political backing.

It is evident that it is at this level that Environmental Impact Statements (EIS), which are prepared on the basis of aggregated or disaggregated EIA (in any case simplified in their technical aspects), will have an enormous influence on socioeconomic activities as a whole, in the sense that they will effectively reveal the environmental consequences of overall actions in specific areas. They are, or should be, the basis for implementation of environmental laws and regulations for areas or sectors or for matters such as land use, pesticides, emission levels in watercourses or the atmosphere, use of scarce and exhaustible energy resources, etc. This will mean defining norms with the necessary scientific basis and adapted to the national situation. It is not a matter of determining *a posteriori* what damage has been caused, but rather of forecasting future situations, incorporating data on effects and impacts into the body of the programme or project itself.

In this respect EIA provides objective information of great value at the different levels mentioned above, ranging from correct identification of actions and their consequences to estimates of the magnitude of negative impacts.

Complete and detailed EIAs only makes sense, however, at the level of specific development and operational projects either integrated in the plans and programmes or standing alone. They are not warranted for general plans and overall strategies, since they merely become qualitative appraisals and lose their quantitative specificity which, despite all the shortcomings, is the only means of ensuring the validity of EIA studies. Here is a sample of the many types of project which will be encountered (the list is merely illustrative):

a) *Land use and transformation*: Urban development, industrial and agroindustrial projects, agricultural activities, airports, roads, transmission lines, watershed development...

b) *Extraction of material resources*: Mining, logging, commercial hunting and fishing, marketing of native fauna and flora...

c) *Agricultural processes*: Crops, livestock, dairy farming, pasturelands, irrigation...

d) *Industrial processes*: Steelworks, petrochemical plants, metal and non-metal smelting works, pulp and paper mills, chemical processing and cement works...

e) *Transportation*: Railroads, aviation, trucking and public transportation, private automobiles, motorcycles, ships, aqueducts, oil pipelines, gas pipelines...

f) *Energy*: Dams, coal, thermal power stations, nuclear power stations...

g) *Water management and treatment*: Pollutants and toxic wastes, biological emissions, ground water, oceans...

h) *Chemical treatment*: Pesticides, herbicides...

i) *Renewal of resources*: Reforestation, fertilization, recycling of waste products, flood and tide control...

j) *Recreation*: Parks, tourism and vacations, hunting and fishing areas, green areas...

This list could be greatly expanded, but what is worth noting is that this type of classification of actions or activities is precisely the one used in environmental impact studies for the initial classification of an activity. It is in fact a different way of classifying a set of projects in order to facilitate their analysis from the point of view of the environments affected.

2. *Changes*. Changes are the transformations necessarily produced in the environment when an activity is projected or implemented (or *action*, as we called it). These changes should be understood solely in this sense and not given direct qualitative-type connotations; i.e., they are not associated with the concept of environmental quality, at least at this stage of the analysis. They are simply transformations of the environment as the result of an activity and with a view to obtaining the best possible resource yield in the broad sense.

Within the broad range of changes produced in the environment, we can distinguish, firstly, between *natural changes* and *changes caused by man*. The following are categories of natural changes:

a) *Reversible*: floods;

b) *Irreversible*: sedimentation of a lake;

c) *Cyclical*: seasons of the year;

d) *Transitory*: droughts.

Changes caused by man, which are superimposed on natural changes, have a different value, depending on the level of development of the society. For example, hunting and gathering societies cause minimum or marginal change in the environment, regardless of the intensity of their activities. They will never manage seriously to affect the environment, since they are societies which, in their numbers and by the nature of their activities, are not in a position to do so. Moreover, many of them have been and are characterized by a harmonious interrelationship with their habitat. Changes become more significant or structural (i.e., no longer marginal) as societies progressively outgrow the successive historical stages of development. Primitive agricultural

societies, for example, mark the beginning of significant alteration of the natural environment by man and they may have caused the disappearance of certain native species or the introduction of others, as well as structural soil changes. Thousands of years later, current (post) industrial society is not only the creator of the concept of environment but also the cause of its greatest degradation. Industrialization has involved such big transformations that the natural world in many cases may have become a thing of the past.

For example, there is the loss of the vegetation cover in an area as a result of urbanization. The *action* here is the building of houses, streets, services, ancillary infrastructure, etc. All this represents a series of advantages which at the time no doubt justified and warranted the work: providing housing for the population, extending public services, upgrading the quality of the city, extending the radius of action of the commercial belt, modernizing new areas, etc. Loss of the vegetation cover and permeability of the ground are mandatory *changes* which the process of urbanization causes in an ecosystem altered by this process. It is a mechanical question governed by the laws of physics and chemistry. The action-change relation is inherent in the action and is generally contained in every plan, programme or project, even when the environmental point of view is disregarded. Rarely is an urbanization project regarded as one which uses agricultural land for other purposes.

3. *Effects*. The effects on the environment of these *changes* caused by human *actions* are the consequences which these changes may entail for the equilibrium of the ecosystems. The effects may be positive or negative, depending on the way in which the intrinsic properties of the ecosystems are affected. Negative effects are called "environmental damage". To continue with the example of the loss of the vegetation cover as a CHANGE produced by the ACTION of urban development, the corresponding EFFECTS might be the erosion of adjacent hillsides, or impermeability of the soil, or sedimentation and/or eutrophication of nearby rivers, etc.

The determination of these effects is now the responsibility of environmental science, given that these are phenomena directly related to the functions of the physical environment. They are moreover a dimension of analysis that is usually ignored in planning studies, owing in part to the scant consideration given the long term, and in part to the emphasis on financial rather than material flows, as well as to the total disregard of inventories of non-renewable resources, particularly energy.

Analysis of the "material" aspects of a project leads to the conclusion that its most worrying effects are precisely those which objectively involve damage to the environment, for they jeopardize the support base not only of the project itself but also of the human groups directly or indirectly linked to it. However, the determination of effects does not involve qualitative judgements as to their consequences; rather, it gives a physical and ecological dimension to the damage which the activities cause to fairly specific environments.

Effects are analysed by considering three complementary and non-exclusive situations: assessment of an initial state of the environment (reference state); assessment of the future state of the environment "without action", and forecast of the future state of the environment "with action". Since each of these situations is viewed as an integral part of the EIA design process, they are considered in greater detail.

4. *Impacts*. Environmentsail impact implies a *value judgement* (thus qualitative and subjective) of the importance of a certain environmental effect, as defined above. Once this effect has been assessed, an activity's degree of impact is determined as a function of a certain conception of *environmental quality* (determined by agreement in a given society). Thus, an impact is the variation in the quality of the environment . Examples of the impact of the above-mentioned effects would be the loss of arable land (through soil erosion), loss of fishery resources (through sedimentation of a river, and so on. Variations may be positive or negative for the environment, but they will always be associated with value judgements of the importance of these effects on the environment.

The introduction of these value judgements immediately raises the issue of who should make them. It is evident that the pollution of a river will signify greater loss to persons living along its banks for example, who will be objectively conditioned to assign greater weight to the impacts than, say, mountain or valley dwellers. For the latter to place the same weight on the impact it is necessary to generate awareness of the problem and a sense of solidarity with those affected. Environmental scientists and specialists are also certain to assign great weight to impacts because of their knowledge. However, the economic groups responsible for the pollution will prefer to continue dumping their wastes for free or not to treat them, because of the cost involved.

In any case it is essential to determine clearly which sectors are affected by proposed actions, and the extent to which they are affected will be measured by a set of impact indicators, which are parameters for measuring the significance of an effect.

The identification of affected sectors requires arduous groundwork, normally not carried out and the source of much error in EIA. This also lends itself to biased (and self-interested) interpretations of the causes and consequences of an environmental impact. A thorough study should be as clear as possible on this point.

Although the greatest possible amount of information would be ideally desirable, it is essential to have at least some basic social, economic and cultural data. The weighting of one or other will depend on local conditions and no fixed weightings can be prescribed. Socioeconomic and occupational patterns, health standards and lifestyles constitute a first group of basic elements which have to be established. Next, it is necessary to have some idea of cultural aspects such as the traditions, religious beliefs, and aesthetic

sensibility of the social group. Finally, there are psychological and sociological factors which will affect the other factors, either reinforcing or mitigating them, depending on how dependent the social groups are on the mass media and official campaigns and on their political awareness.

All these elements will be used in the formulation of the above-mentioned impact indicators, many of which have traditionally been used as socioeconomic indicators, although from a different perspective. In any case, some will have to do specifically with the environment and will be complex to construct and uncertain, owing to the poverty of the country's scientific development or the inaccessibility of the existing information. There will thus be a broad range of parameters on hand, either numerical (quantitative) or subjective (qualitative). The latter may also be classified according to some kind of ranking system, such as acceptable/unacceptable, good/better/best, etc.

In any event, the identification of affected groups and their breakdown into a series of indicators should be as comprehensive as possible. The winners and losers as a result of the actions and their environmental effects and impacts should be identified as clearly as possible, in time and in space.

D. DESCRIPTION OF EIA

The Environmental Impact Assessments (EIA) is an activity designed to identify and forecast the effects on the environment of proposed legislation, policies, programmes, projects, operational procedures, etc; and to interpret and communicate information about these effects. (Naun, *op. cit.*) So much for the concept of EIA, but in a more limited sense the term EIA involves a set of recognized methods and techniques of environmental management. These are formal procedures, although their scientific foundations are still unstable, the literature dispersed and hard to obtain, and the experts few.

EIAs are calculations and estimates of the consequences of an activity and are in no way a substitute for comprehensive diagnostic and evaluation studies on the state of the environment.

The assessor's task is not to prepare a scientific treatise on the environment but rather, and primarily, to support the decision-making process, especially with regard to selection between alternative ways of carrying out the action in question and consideration of alternative environmental management strategies.

To avoid confusion, a certain rigour is necessary in the use of terms. Based on the most important works in the literature on the subject, we will consider the following phases, each corresponding to the basic elements of an EIA, as established in the previous chapter.

CHANGE: Natural or man-made alteration of the environment.

EFFECT: Consequences of a man-made change.

IMPACT: Variation in environmental quality. The expression "impact" implies a value judgement on the importance of an environmental effect.

ACTION: Project, proposed legislation, policy, programme or operational procedure with environmental implications.

EIA: Activity designed to identify and forecast effects and impacts and interpret and communicate information about them.

With this sequence in mind, the EIA study should contain a set of parts covering each of the phases.

1. Preparation process

The following factors should be taken into account in the preparation of an EIA:

a) The EIA should be an integral part of the development activity in question and should begin at the same time as other project evaluations (technical, economic, sociopolitical etc.). Just as project development in mixed economies means their reformulation to include "social" considerations in the assessment, it is also possible to establish compulsory environmental requirements, such as an EIA. Evidently, parallel development of these evaluations would be a big help in decision-making and in ensuring better use of available resources. It will also mean more integrated use of the information provided by the project.

b) The EIA should be considered within the framework of the most relevant national and intergovernmental objectives and policies. This means that it is not enough to legislate to make EIA mandatory in projects, but that the study must correlate with environmental and overall resource policies. EIA studies sometimes tend to get too big and demand excessive technical and financial resources, without their subsequent results justifying such an outlay. The struggle can then shift to the establishment of major guidelines, at the constitutional level for example, to back the production of a more or less elaborate EIAs, but not the other way round.

c) The EIA should clearly identify the institutional mechanisms involved, not only to control the production of the study, but as a way of integrating sometimes dispersed activities and effectively enriching it and providing a greater number of viable options.

2. EIA content

Within the context described above, an EIA should contain the following components, all developed in the degree of detail required by the priority and urgency of the study.

- Description of *proposed actions* and of their options;
- Description of the *relevant components* of the affected environment;

- Forecast of the nature and magnitude of the environmental changes caused by the actions and of their positive and negative effects (natural and man-made);
- Identification of community *interests* affected with regard to the environment, their weighting and priorities, and identification of the social groups which represent these interests;
- Listing of the *impacts* and of the *methods* used to determine their relative significance;
- Prediction of the magnitude of the *impact indicators* for the project and its options;
- Recommendations for accepting or rejecting some of the options;
- Recommendations for *control* procedures;
- Description of their *integration* in the planning process.

3. Substantive reports

As part of the process outlined above, the following substantive elements (in the form of reports) should be contained in an EIA:

a) *Description of the action*: The EIA study should contain the maximum amount of information regarding the action (project, programme, etc.) for each of its possible options.

b) *Description of the environment*: Once again it should be emphasized that the basic purpose of an EIA is to identify and predict the environmental effects and impacts of concrete actions; therefore the assessor's task is not to prepare a scientific treatise on the environment involved, but rather to support the decision-making process as thoroughly as possible. For this it is necessary to examine as much available information as possible, making a selection of scattered and non-integrated data. It must be added that emphasis should be placed on the relevant components of the directly or indirectly affected environment. More specifically, reference can be made to the concrete types of effects and impacts illustrated above, without getting into the quantification or qualification of these impacts at this stage but just identifying them.

Likewise, the types of action identified in the same chapter could serve as a guide for the analysis.

These first two phases are very important since they will affect all the remaining work in two main areas:

- Identification of action options with major consequences for the environment (effects and impacts), and
- Consideration of alternative strategies for environmental management and organization in the light of the study.

c) *Estimation of changes*: This stage is essentially one of predicting the nature and magnitude of the changes which will be produced in the environment by the projected human actions. The magnitude of the changes

should be studied, covering both basic socioeconomic information and data on the characteristics of the area.

d) *Identification of the society*: The EIA should also identify the individuals affected by the action and their concerns or interests regarding the transformation of the environment involved. It is important to point out, in any case, which groups or social classes represent these interests and the range of their concerns, since there could be marked differences, especially in terms of socioeconomic stratification. Naturally, it is necessary to detect which of these concerns are in effect the most relevant, in order to concentrate on them.

e) *Measurement of effects*. This is a key stage in an EIA, one which gives it its specific content, since all the preceding stages are designed to support this one. The effects in this stage result from man's interference with the environment, in particular the damage resulting directly or indirectly from his actions.

Specifically, an EIA should take the following situations into account:

– Initial reference state: This is deduced from a state of the environment defined in time and space in terms of a set of characteristics to be previously selected. This is a very complex task, particularly in view of environmental dynamics and the cyclical and uncertain components.

– Future "without action" state: The elements which comprise an environment do not necessarily remain at current levels, independently of the project under study. There are environments which naturally vary greatly owing to climatic or merely weather factors. It is therefore necessary to project the future state of the environment, taking into account of course the corresponding levels of uncertainty. These changes include natural ones, which could be long-term irreversible trends implying an evolution of the environment from one state to another or trends caused by man, especially when he pushes ecosystems beyond their natural capacities. In the majority of cases it is combinations of these two phenomena which signify the greatest transformations of the environment.

– Future "with action" state: This same analysis should be made for the future, on the assumption that the projected action will occur, in order to compare situations.

4. Factors which influence an EIA

- An EIA should investigate all the relevant physical, biological, economic and social aspects. The degree of detail will depend on the scope of the project and its possible impacts;
- At each stage of an EIA *inventories* should be prepared of sources of information and technical assistance;

- An EIA should include a spatial frame of reference which is larger than the area affected by the action and extends beyond the limits of the activity under study;
- An EIA should include both medium- and long-term forecasts. In the case of an engineering project this should be done:
  - during construction;
  - during operation;
  - on completion of operation and development;
  - two or three decades later;
  - after abandonment of the project.
- Environmental impacts should be assessed as the difference between the future state of the environment if the action does take place and if it does not;
- Estimates should be made both of the *magnitude* and of the *significance* of impacts;
- EIA methods should be selected according to their suitability to the *nature* of the action, the *data base* and the *geographical setting*;
- The zones and parts affected should be clearly identified, together with the corresponding major impacts.

5. Impact indicators

These are parameters which measure, at least in some qualitative way, the significance of an effect or impact. Some have numerical scales associated with them, such as *infant mortality* or *crop yields*. Others may only be described in terms of "good-better-best" or "acceptable-unacceptable". The selection of a relevant set of indicators is often a critical step in the EIA process and requires guidelines from decision-makers. Their mere selection already determines social priorities.

In the case of the design of an industrial plant, for example, the process is simplified from the environmental point of view if indicators such as emission standards for various pollutants or air and water quality standards have been previously defined. These values are obtained from available toxicological data relating exposure to pollutants to effects on health and vegetation, while at the same time indicating the best feasible technologies. The evidence may be inconclusive or controversial, but the assessor must accept the standards defined. If these do not exist, other options may be proposed on the basis of standards used in another country. However it should be noted that while standards can be useful, they do not reflect the totality of human interests. It is therefore necessary to set limits on their validity.

Once the indicators and their scales have been selected, their values should be estimated for each action, with prior indication of the environmental effects for each project option, and for different time scales.

6. Degree of detail in an EIA

The degree of detail in which an EIA must be developed for a given case depends on a series of variables, including the following:

- Sensitivity of the local environment;
- Scale of the proposed action and its potential effects;
- Social value assigned locally and nationally to conservation or improvement of environmental quality;
- Resources and scientific and technical capacity of the country;
- Time available for the assessment.

7. Applicability of an EIA

EIAs have been widely used in industrialized countries, but in principle they can be used anywhere, provided that they take into account not only the physical and biological characteristics of a particular region, but also local socioeconomic priorities and cultural traditions. The process of preparing and applying an EIA should not be seen as an obstacle to economic development or a curb on modernization or industrialization, but rather as an aid in planning the rational use of a country's natural resources.

E. SELECTION OF EIA METHODS

1. Stages of an EIA

In simplified form, the stages which the analyst must go through in making the study are as follows:

a) Identification of effects and impacts;
b) Forecasting of effects;
c) Forecasting of impacts;
d) Communication of results;
e) Recommendations on control procedures.

2. Classification of EIA methods

One important problem is the choice of the methods most suited to the conditions of a particular affected environment and to a country's situation. One way of systematically organizing the selection of a method is to use a questionnaire such as the following:

a) Is the method sufficiently *comprehensive*? This is fundamental for detecting the total range of significant elements.

b) Is the method sufficiently *selective*? The answer to this question requires a tentative prior determination of the importance of the effects and impacts. A list can be made of the human interests most sensitive to the

effects of the environmental impacts of the project, in terms of the manner in which they will be affected.

c) Is the method *mutually exclusive*? This is necessary in order to avoid double-counting of impacts, which it is possible to do, given the interrelationships. For example, the tourist industry may be an economic matter for those who derive their income from it, a social matter for those using the area as a permanent habitat, an ecological matter for those concerned by the effect on wildlife, and so on.

d) Does the method generate estimates of the *reliability limits* of the forecasts? It is useful to include some kind of calculation of uncertainty (on a subjective basis, for example), which could lead to the questioning of forecasts. Once the range of uncertainties is estimated, at least three separate analyses should be made –of the most plausible, the less plausible and the least plausible case. To each of these is ascribed a numerical value of the elements forecast.

e) Is the method *objective*? This is desirable in order to minimize the possibility of forecasts being influenced by the preconceptions of the study's promoters and consultants, which could be due, for instance, to lack of knowledge of local conditions, insensitivity to public opinion, etc.

f) Does the method predict *subsequent interactions*? Environmental, social and economic processes often have feedback mechanisms. Thus, a change in the magnitude of an environmental effect or impact indicator could magnify the effect on or influence the state of other parts of the system.

g) Does the method identify *unacceptable impacts*? There are actions which could produce totally unacceptable impacts, such as the destruction of an historical site for example.

3. Adaptation of methods

Most EIA methods have been developed and used in the United States and have not been totally validated, although there is an enormous amount of accumulated experience. Their validity for other countries, particularly for developing countries, should be reviewed in each case, in particular with regard to socioeconomic impacts. A key limitation is the absence of environmental legislation and of accepted standards of environmental quality. In the selection of EIA procedures account should be taken of such matters as inventory of environmental legislation, availability of permanent monitoring stations, personnel training, etc.

4. Review of methods

a) *Methods of identification*

i) *Inventories*: These are comprehensive lists of environmental effects and impact indicators designed to provide the analyst with the necessary data for adequate diagnosis of the possible consequences of projected actions.

ii) *Matrices*: These are lists of human actions cross-tabulated with lists of impact indicators. The two lists are interrelated in one matrix for use in identifying (up to a certain limit) cause-effect relationships.

iii) *Flow-charts*: Flow-charts are used to identify action-impact relationships. This method is more suitable for one-off and relatively small projects but not for major ones, since the flows could become so large as to be unusable in practice.

b) *Methods for forecasting the magnitude of effects*

All forecasts of the absolute and relative magnitude of effects and impacts are based on conceptual models which simulate the workings of the universe. For this reason they cannot be catalogued, for the range of possible alternatives is enormous. Assuming that the problem is well formulated and not too complex, scientific methods may be used to obtain useful forecasts. There are no adequate methods for predicting the values of *qualitative* variables. These tend to be estimated, or at least specified by indicative terms such as *degradation, no change* or *improvement* in environmental quality or by assignment of a qualitative ranking (1-5/5-10/10-50/etc).

c) *Methods of forecasting the magnitude of impacts*

Once the effects of a proposed action have been estimated, the next step is to decide whether they are significant. One group of impacts is easy to estimate, i.e., impacts for which there are standards, criteria, codes, regulations or objectives. The rest have to be estimated on the basis of qualitative judgements, which could involve some of the following:

i) *Opinions of decision-makers*;

ii) *Opinions of specialists* (ecologists, geographers, hydrologists, agronomists, urban planners, sociologists, etc);

iii) *Past precedents*;

iv) *Public opinion* (determined by opinion polls, public hearings, etc.).

d) *Methods for comparing impacts*:

i) *Individual indicators*: This involves devising and calculating sets of values for individual impact indicators. It avoids the problem of synthesis by deciding on a small group of compact indices. A qualitative picture of the aggregate impact could be deduced from these data.

ii) *Ranking*: This means assigning the options to impact categories. It is the classification of options into groups of impact indicators. This makes it possible to determine which options have the least adverse impact (or the most beneficial) on the largest number of indicators. Since the indicators are not weighted, total impacts cannot be compared.

iii) *Standardization and weighting*: In order to compare indicators numerically and obtain aggregate results for each option, the scales of impact indicators should be expressed in comparable units. An objective allocation method should be selected for this purpose. Finally, a weighting method may be necessary in order to obtain an aggregate index for the comparison of options. This can be done in several ways:

– With a tally of the number of impacts (negative/insignificant/positive) and aggregation by class;

– When the impact indicators are expressed in comparable units, they can be assigned equal weights;

– Assignment of weights according to the number of persons affected;

– Assignment of weights according to the relative significance of each impact indicator.

e) *Communication methods*

It is necessary to avoid misunderstandings or ambiguities due to the use of unfamiliar scientific jargon or units of measurement scales. It is also necessary explicitly to state criteria and assumptions underlying the value judgements and balances. Affected sectors should also be identified as clearly as possible.

f) *Control methods*

Once an action is concluded, the environmental quality may fall below the designed standards owing to such factors as:

– Incorrect or incomplete impact assessment;

– Natural deterioration of the environment (earthquake, drought);

– An accident (fire) or structural flaw in a component (rupture of a pipeline);

– Human error (discharge of oil, in coastal waters, improper use of a pesticide);

– Design error (insufficient safety margins).

Control procedures should always take these possibilities into account and provide for periodical checks of equipment and for safety procedures and regular monitoring programmes.

F. GENERAL METHODS FOR ESTIMATING IMPACTS

This chapter has basically been taken from (Munn, *op. cit.*), (Holling, 1978) and (Estevan, 1984).

1. Leopold matrix (1971)

The Leopold matrix was originally designed to assess the impacts of construction projects. In essence, it is a *list* which incorporates qualitative information and *cause-effect* relationships, but it is also useful for organizing data and for communication purposes. The Leopold system consists of an open matrix which can contain 100 project actions along the horizontal axis cross-tabulated with 88 environmental characteristics and conditions along the vertical axis. Thus it is a matrix containing 8 800 boxes. At the same time a system of ranges (on a scale of 1-10) is established for each matrix box for the magnitude and scope of each possible impact. This means that the matrix can contain a total of up to 17 600 items. Thus, it is enormous and very difficult to manage, unless computer facilities are available.

Despite its limitations, it could serve as a very useful initial guide. In this respect an EIA assessor can modify the matrix, reducing the number of boxes or developing partial matrices, according to the resources available for the study or its particular conditions. For example, a set of 8 to 12 of these smaller matrices could be a useful tool at the start of an assessment or when resources are limited. It is an excellent visual aid, although it has the following limitations:

– There are no criteria based on numerical values: the matrix only gives qualitative estimates of possible impacts;

– There is no synthesis of predictions: aggregation is very difficult in view of the non-numerical nature of the impacts;

– It does not indicate groups affected by the impacts: it limits itself to detecting them.

a) *Instructions for its use*

i) Identification of all the ACTIONS of the project. These constitute the columns of the matrix and are located horizontally (a, b, c, etc.).

ii) Definition of all the environmental CHARACTERISTICS and CONDITIONS. These constitute the lines of the matrix and are located vertically (A, B, C, etc).

iii) In the boxes thus formed, a diagonal line should be placed (/) in all those in which an action has an impact on a specific characteristic or environmental condition.

iv) In cells containing a diagonal line (indicating an action with an impact), a number from 1 to 10 is entered in the lefthand corner, indicating the MAGNITUDE of the possible impact. Ten represents the greatest

magnitude and 1 the smallest. If the impact is positive, this is indicated with a + sign. A number from 1 to 10 is entered in the righthand corner, indicating the IMPORTANCE which the analyst places on the possible impact. Ten represents the greatest importance and 1 the least.

v) A report is then prepared containing a discussion of the significant impacts, which are those columns and lines with the greatest number of marked cells, and individual cells with the highest numbers.

b) *Matrix content*

(The letters are those used by Leopold.)

COLUMNS: Actions

A. *Modification of the ecosystem*

a) Introduction of exotic fauna and flora
b) Biological controls
c) Habitat modification
d) Alteration of vegetation cover
e) Alteration of ground-water system
f) Alteration of drainage
g) Control of the course and flow of rivers
h) Canalization
i) Irrigation
j) Climate modification
k) Burning
l) Paving of surface areas
m) Noise and vibration

B. *Transformation of land*

a) Urbanization
b) Location of industries
c) Airports
d) Highways and bridges
e) Roads
f) Railroads
g) Cables and lifts
h) Transmission lines, ducts and pipelines
i) Barriers and fences
j) Dredging of river-beds
k) Lining of river-beds
l) Canals
m) Dams and reservoirs
n) Wharves, breakwaters, docks and ports

o) Onshore utility structures
p) Onshore recreational structures
q) Blasting and drilling
r) Levelling and filling
s) Tunnels and underground structures

C. *Resource extraction*

a) Blasting and drilling
b) Surface excavations
c) Deep excavations
d) Drilling of wells and displacement of fluids
e) Dredging
f) Clearing and exploitation of forests
g) Commercial hunting and fishing

D. *Processes*

a) Agriculture
b) Stock-raising
c) Grazing land
d) Dairy farming
e) Energy generation
f) Processing of minerals
g) Metallurgical industry
h) Textile industry
i) Automobiles and airplanes
j) Oil refineries
k) Food
l) Exploitation of forests
m) Pulp and paper
n) Product warehousing

E. *Alteration of the ground*

a) Erosion control and terracing
b) Mine closures and waste control
c) Rehabilitation of open-cast mines
d) Changes in the natural landscape
e) Dredging of ports
f) Filling and draining of marshlands

F. *Resource renewal*

a) Reforestation
b) Conservation and wildlife management

c) Ground water restoration
d) Use of fertilizers
e) Recycling of wastes

G. *Traffic changes*

a) Railways
b) Automobiles
c) Trucks
d) Ships
e) Aviation
f) River and canal traffic
g) Recreational sailing
h) Footpaths
i) Cables and lifts
j) Communications
k) Ducts

H. *Dumping and treatment of wastes*

a) Dumping into the sea
b) Landfills
c) Dumping of tailings, rubble and overburden
d) Underground storage
e) Slag-heaps
f) Sealing of oil wells
g) Siting of deep wells
h) Discharge of cooling water
i) Dumping of municipal refuse, including discharge of irrigation water
j) Discharge of effluents
k) Stabilization and oxidation tanks
l) Septic tanks (commercial and domestic)
m) Smoke-stack and exhaust emissions
n) Used lubricants

I. *Chemical treatment*

a) Fertilization
b) Chemical de-icing of highways
c) Chemical soil stabilization
d) Weed control (herbicides)
e) Insect control (pesticides)

J. *Accidents*

a) Explosions
b) Leaks and drips
c) Operational defects

LINES: Environmental characteristics and conditions

A. *Physical and chemical characteristics*

1. *Land*
   a) Mineral resources
   b) Construction material
   c) Soils
   d) Conformation of natural landscape
   e) Fields of force
   f) Scenic attractions
2. *Water*
   a) Surface water
   b) Oceans
   c) Groundwater
   d) Quality
   e) Temperature
   f) Reclamation
   g) Snow and ice
3. *Atmosphere*
   a) Quality (gases, particles)
   b) Climate (micro, macro)
   c) Temperature
4. *Processes*
   a) Floods
   b) Erosion
   c) Deposition (sedimentation, precipitation)
   d) Solution
   e) Absorption
   f) Consolidation and subsidence
   g) Stability (landslides and cave-ins)
   h) Deformations (earthquakes)
   i) Air movements

B. *Biological conditions*

1. *Flora*
   a) Trees
   b) Shrubs
   c) Pasture
   d) Crops
   e) Microflora
   f) Aquatic plants

g) Endangered species
h) Barriers
i) Pipelines

2. *Fauna*

a) Birds
b) Land animals
c) Fish and shellfish
d) Deep-sea organisms
e) Insects
f) Microfauna
g) Endangered species
h) Barriers
i) Pipelines

C. *Cultural factors*

1. *Land use*

a) Open spaces and wilderness
b) Marshes
c) Forests
d) Stock-raising
e) Agriculture
f) Residential
g) Commercial
h) Industrial
i) Mines and quarries

2. *Recreation*

a) Hunting
b) Fishing
c) Recreational sailing
d) Swimming
e) Camping and hiking
f) Picnics
g) Shelters

3. *Aesthetic and human interests*

a) Scenic views
b) Quality of wildlife
c) Quality of open spaces
d) Landscape design
e) Unique natural attractions
f) Parks and reserves
g) Monuments

h) Scarce and unique species and ecosystems
i) Historical or archaeological sites or artifacts
j) Presence of antisocial elements

D. *Ecological relationships*

a) Salinization
b) Eutrophication
c) Diseases (insect transmitters)
d) Food chains
e) Salinization of surface areas
f) Vegetation loss
g) Other

2. System of colour transparencies (1968)

This method consists of developing a series of colour transparencies which are used to identify, forecast or assign relative importance to and communicate information about impacts deriving from a geographically defined action. The area is subdivided into convenient geographical units, based on a uniformly spaced network, topographical features and different land uses. Within each unit information is gathered about the environmental factors and the interests and preferences of the groups involved. The methods can include:

- aerial photography;
- topographical surveying;
- land inventory maps;
- field observations;
- public meetings;
- discussions with local specialists and cultural or religious groups;
- sampling techniques.

Human concerns are grouped into a set of characteristics, each with a common base to avoid conflicts. A regional map is drawn for each characteristic identified, with 10 being a practical number to use. Thus, by using a series of transparencies, appropriate land use, compatibility of actions and engineering feasibility can be visually evaluated in order to identify the best combination.

Transparencies can provide both quantitative and qualitative data. In each transparency, the *sensitivity* of the area to the impact or the *intensity* of the impact is visually obtained through degrees of shading; for example on a scale ranging from *white* (very insensitive) to *black* (very sensitive). Aggregates of the predicted impacts and the search for optimum routes can be made by computer if facilities are available. The transparency method is more useful when there are spatial variations in the impacts: the Leopold

matrix approach, for example, does not deal successfully with spatial heterogeneity.

3. Batelle system

This system of environmental assessment was designed by Battelle-Columbia laboratories to estimate the impact of water-resource development, water-quality management plans, highways, nuclear plants, etc. Human interests are separated into four categories of factor:

a) *Ecological*
b) *Physical and chemical*
c) *Aesthetic*
d) *Social*

In detail, these factors are the following:

A. *Ecological factors*

a) *Land species and populations*
- Livestock
- Crops
- Pests
- Birds

b) *Aquatic species and populations*
- Commercial fishing
- Natural vegetation
- Pests
- Recreational fishing
- Aquatic birds

c) *Habitats and land communities*
- Food chains
- Land use
- Scarce and endangered species
- Species diversity

d) *Habitats and aquatic communities*
- Food chains
- Scarce and endangered species
- Characteristics of the environment
- Species diversity

e) *Ecosystems*

B. *Physical and chemical factors*

a) *Water quality*

- Biological losses of the watershed
- Biochemical demand for oxygen
- Dissolved oxygen
- Faecal bacilli
- Inorganic carbon
- Inorganic nitrogen
- Inorganic phosphate
- Pesticides
- pH
- Flow variations
- Temperature
- Total dissolved solids
- Toxic substances
- Turbidity

b) *Air quality*

- Carbon monoxide
- Hydrocarbons
- Sulphur oxides
- Other

c) *Ground contamination*

- Land use
- Soil erosion

d) *Noise pollution*

- Noise

C. *Aesthetic factors*

a) *Earth*

- Surface geological matter
- Relief features and topography
- Width and alignment

b) *Air*

- Smell and appearance
- Sounds

c) *Water*

- Appearance
- Earth-water interphase
- Fetid and floating matter

- Water surface area
- Geological and wooded coasts

d) *Biota*

- Domestic animals
- Wild animals
- Diversity of vegetation types
- Diversity within vegetation types

e) *Man-made objects*

- Man-made objects

f) *Composition*

- Composite effect
- Unique composition

D. *Human and social factors*

a) *Educational and social*

- Archaeological
- Ecological
- Geological
- Hydrological

b) *Historical*

- Architecture and styles
- Events
- Persons
- Religions and cultures
- Boundaries

c) *Cultures*

- Indigenous
- Other ethnic groups
- Religious groups

d) *Moods and atmosphere*

- Fear and inspiration
- Solitude and loneliness
- Mystery
- Feeling at one with nature

e) *Life patterns*

- Employment opportunities
- Housing
- Social interactions

As can be seen, each category contains a number of components and each component has a relative weight. An environmental quality index is established for each component on a scale of 0-1 using value-function curves. Each value index on the curve is obtained as the difference in environmental quality between the "with action" and "without action" states, which are the maximum and minimum. The steps for applying the system are as follows:

i) Obtain information on the relationship between the chosen parameter and the environmental quality;

ii) Arrange the order in such a way that the lowest value is "0" and the highest "1";

iii) Divide the quality scale (abscissa) into equal intervals between a minimum and a maximum and determine the appropriate value of the parameter for each interval. Continue the process until the curve is completed;

iv) Repeat steps 1 through 3 with different specialists, until the average curve is established;

v) Have the participants check their respective curves against the average. Modify the curve if necessary;

vi) Repeat steps 1 through 5 with a different group of specialists, to test the reproduceability and representativity of the study;

vii) Repeat steps 1 through 6 for all the related parameters;

viii) Weight the parameters. A relative numerical weighting is assigned to all the impact indicators which are set for each type of project. The weightings are also set with a group of specialists. Given the value of each impact indicator and the corresponding weighting, the overall impact of each project can be calculated by *weighted aggregation;*

ix) Check to see if the value of the impact is estimated from inadequate data or if the value of a particular impact is unacceptable.

BIBLIOGRAPHY

Allen, R. (1980): *How to save the world. Strategy for World Conservation* (IUCN/UNEP/WWF), New York.

ECLAC (Economic Commission for Latin America and the Caribbean) (1983): *Estilos de desarrollo, energía y medio ambiente: un estudio de caso exploratorio*, Estudios e Informes de la CEPAL series, No. 28 (E/CEPAL/G.1254), Santiago, Chile.

Eckholm, E. P. (1977): *The Picture of Health Environmental Source of Disease*, New York, W. W. Norton and Co.

Estevan B., M. T. (1984): *Evaluación del Impacto Ambiental*, Madrid, Fundación M. APFRE,

Galeano, E. (1984): *Las venas abiertas de América Latina*, Mexico City, Siglo XXI Editores.

GEMS (Global Environmental Monitoring System) (1980): *Air Quality in Selected Urban Areas, 1977-1978*, UNEP/WHO, Nairobi.

Gligo, N. (1981): *Estilos de desarrollo, modernización y medio ambiente en la agricultura latinoamericana*, Estudios e Informes de la CEPAL series, No. 4 (E/CEPAL/G.1117), Santiago, Chile. United Nations publication, Sales No.: S.81.II.G.9.

Gligo, N. and J. Morello (1980): "Notas para la historia ecológica de América Latina", in O. Sunkel and N. Gligo (eds.), *Estilos de desarrollo y medio ambiente en América Latina*, Lectura series, No. 36, Mexico City, Fondo de Cultura Económica.

Gorz and M. Bosquet (1978): *Ecologie et politique*, Paris, Ed. du Seuil.

Holling, C. S. (ed.) (1978): *Adaptive Environmental Assessment and Management*, International Systems Analysis (IIASA), No. 3, Chichester, U.K., John Wiley and Sons.

Lader, L. (1971): *Breeding Ourselves to Death*, Foreword by Paul R. Ehrlich, New York, Ballantine Books.

Lovins, A. B. (1977): *Soft Energy Paths. Toward a Durable Peace*, New York, Penguin Books.

Munn, R. E. (ed.) (1979): *Environmental Impact Assessment Principles and Procedures*, Scope 5, second edition, Chichester, U.K., John Wiley and Sons.

Pearce, D. (1976): *Environmental Economics*, London, Longmans.

Portney, P. R. (ed.) (1978): *Current Issues in U.S. Environment Policy*, Resources for the Future series, Baltimore, The John Hopkins University Press.

Robinson, J. P. (1979): *The Effects of Weapons on Ecosystems*, Fairview Park, Ohio, Pergamon Press/UNEP.

Sunkel, O. (1981): *La dimensión ambiental en los estilos de desarrollo de América Latina* (E/CEPAL/G.1143), Santiago, Chile.

Toledo, V. M. (1983): *La otra guerra florida. Ecologismo y ecología política*, Mexico City, Nexos.

United States Government (1980): *The Global Report to the President: Entering the Twenty-First Century*, A Technical Report, vol. II, Washington, D.C., U.S. Government Printing Office.

II

ENVIRONMENTAL PROTECTION MEASURES, THEIR EVALUATION (COST-BENEFIT ANALYSIS) AND THEIR INCORPORATION IN DEVELOPMENT PLANNING*

by José Leal**

SUMMARY AND CONCLUSIONS

This study is a critical presentation of the main theoretical elements –concepts, approaches and methods– in the use of Cost-Benefit Analysis (CBA) as a support tool in environmental policy and, more specifically, in decisions concerning implementation of environmental protection measures.

Both the theoretical and practical results of the research on which this study is based allow the conclusion that the controversies surrounding the use of CBA for evaluating environmental policy decisions arise out of a series of factors related to the overall socioeconomic structure, factors which, on the whole, are not precisely methodological in nature, such as calculating a certain cost, estimating a particular benefit or choosing a discount rate. Instead, the key issues involve the complexity and scope of decisions affecting the environment and the feasibility of applying a method such as CBA to them. Use of CBA extends beyond mastery of the tool to become a paradigm containing other elements besides the technical ones. Thus in order to use CBA, it is essential to have an adequate understanding of the natural system in which the action occurs, as well as of its interactions with the social system involved, for the purpose of selecting the most adequate CBA methods and techniques. The environment, the system in which the natural and social systems interface, should be studied on the basis of a systemic approach which takes into account the complexity of the interrelationships. Furthermore, once the system is delimited, careful co-ordination is required

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with the environmental management procedures and mechanisms to be used in controlling the system affected by the measure. In other words, CBA is something more than the mere use of monetary tools or financial flows and should take into account the physical nature of the effects of the economic activity. Moreover, the particular characteristics and the limited understanding of some of the effects of human actions on the environment, especially over the long term, make for great uncertainty in many decisions, which consequently implies high levels of risk. Both of these factors should be considered in cost-benefit analysis. Finally, the need to ensure that actions which affect the environment are consistent with and integrated in the development process, means identifying the links between each environmental protection project and global and regional planning, establishing the consequences of the various development styles for the environment and quality of life.

All these elements place major structural constraints on the application of CBA to environmental protection measures; this led to the proposal, as a synthesis of the research, of an operational framework for environmental CBA calculations, which would take these limitations into account and provide means of overcoming them.

The general conclusion of this study is that CBA is feasible and useful, as a method for supporting environmental policy decisions, despite being controversial. Moreover, it provides the necessary economic dimension in the evaluation of environmental policies. However, it cannot be used partially and in isolation but only within a context which takes into account the other dimensions of the issue, since in many cases these are crucial to the meaningful and correct use of CBA in the evaluation of environmental protection measures. It is in this broader context that this methodology should be used, and the operational framework proposed is an attempt to meet this requirement. Otherwise CBA will never be anything more than a pseudoscientific calculation designed to legitimize positions based on economic considerations which disregard the long-term nature of environmental phenomena in a blind push for short-term exploitation. CBA is neither a panacea for harmonizing environment and development nor a useless calculation. It is an important support methodology for decision-making and as such it must take into consideration the distinctive nature of the environmental issue and the rational use of resources.

INTRODUCTION

Concern for environmental management and planning instruments in Latin American countries has existed ever since the Conference on the Human Environment in Stockholm in 1972. In a nutshell, the basic issue which has concerned governments and international agencies since then has been the

reconciliation of environmental objectives with economic and social ones. In other words, how to harmonize the need for a healthy environment –prevention of pollution, adequate and rational use of natural resources, developing social spaces which are aesthetically pleasing to human life– with national imperatives of growth and development. The true magnitude of the problem becomes evident in the light of the need to include the environmental dimension in development plans and projects without adversely affecting the frequently inescapable priorities of economic and social development (Sunkel and Gligo, 1980).

One of the methodological instruments for attaining these objectives has been CBA. This study deals with the advantages and limitations of its application in the context described above.

The research referred to earlier was developed in three parts: part one involved analysis of a selected set of case studies in which CBA was applied to the environmental protection measures introduced in various countries. To begin with, the various available studies submitted by different governments were collected, classified and categorized. This organizational exercise was followed by the identification of a basic methodology to detect the dominant trends in this type of study. (UNEP, 1979a; UNEP, 1979b). This led into the second part of the research, which consisted of reconciling the methodological base with the terminology in order to make the case studies comparable (UNEP, 1979c; UNEP, 1980a). Part three involved a synthesis of the analyses of actual cases, together with a theoretical consideration of the problem, which led to the establishment of an operational framework for the use of CBA in decisions concerning the environment, in which the essential problems of its use became apparent (UNEP, 1979d; UNEP, 1980b). Part four of this research which was not carried out, had envisaged the preparation of a manual on the economic evaluation of environmental protection measures, designed to provide analytical aids and action options for assessors, planners and decision-makers in the environmental protection field, with special emphasis on the needs of developing countries.

The theoretical framework used throughout the research and underlying this study is the branch of economics known as Environmental Economics. In simple terms it can be defined as the area of economics which deals with a resource depleted by contemporary development, as is the environment. More specifically, it deals with the optimal allocation of the elements which the environment provides for the human development process.

Without going into an exhaustive analysis of the concept, the human environment may be defined as the set of circumambient conditions in which man lives, from which he obtains the resources for his subsistence and his material and spiritual development, where he establishes his habitat, and into which he discharges the residues of his everyday activities. From this perspective, the environment provides a set of functions which constitute an

overall support system for human activity, a system of great complexity and sensitivity which provides the means by which all forms of life are sustained.

On the basis of this definition, environmental economics states that its different elements are economic goods, which means that they are scarce goods. This derives from the premise that nature does not provide a sufficient amount of environmental resources to satisfy man's wants. Contrary to what was traditionally thought, these goods and services are by no means "free", not even if they are practically inexhaustible or the demand for them is almost nil. The consequence of the assumption that these goods are free, is that it excludes from the economic system many of the functions of the system which today we call the environment.

The basic concepts of environmental economics underlie the whole of this study (Sunkel and Leal, 1983). The general frame of reference adopted is that of a mixed economy. In other words, analyses, criticisms and conclusions are in essence valid for economies in which private markets are the main vehicles for allocating and exploiting resources, with broad participation by the State as a regulatory and planning agency. This is precisely the case of the majority of the Latin American economies.

Against this background it is interesting to point out that environmental economics as a specific branch of economics has contributed a new approach to the critical analysis of economic theory in various respects, among which may be briefly mentioned:

a) The need for an approach to socioeconomic activity based on a broader model of the economic chain which does not end with consumption but instead includes waste management and disposal as a fundamental economic process in modern economies, as well as total incorporation of all natural resources, goods and services into the chain.

b) The contribution of a long-term perspective which looks beyond the limited framework of immediate gain and at the same time takes into account future generations, with the corresponding implications for the use of environmental functions over a broad temporal horizon.

c) Consideration of the physical reality of the natural cycles of matter and energy in an attempt to develop an economic perspective based on objective natural laws instead of exclusively on market laws, which where environmental issues are concerned are heavily distorted and in many cases non-existent.

A. FUNDAMENTALS OF ENVIRONMENTAL PROTECTION

1. Economics of environmental protection

Discussion of the need for economic evaluation of activities, projects or measures intended to protect and restore the environment, highlights the

problem of the methodological tools available for this evaluation. Already the environmental issue is a new element in the discussion, given the extent to which awareness of the deterioration of mankind's environmental heritage has been expanded and developed. The first conclusion is that a comparison of the advantages and disadvantages (or the costs and benefits) of such actions is a logical and prudent way of approaching the problem. Thus, Cost-Benefit Analysis (CBA), the basic tool for the evaluation of projects, in the broad sense emerges as one of the few if not the only general methodology for evaluating the economic performance of an activity. The rationale underlying CBA, the balancing of benefits against costs for the purpose of selecting the option which provides the greatest net benefits, or the least costs, or the best cost/benefit relation, seems, to be acceptable in principle. This overall rationale has a universal value, independent of the individuals or groups which adopt it or of the specific conditions in which it is applied. This applies to the basic principle since there may be different approaches.

Take, for example, the viewpoint of the individual who seeks to maximize his profits or of the community which seeks to optimize social welfare; or the case when the aim is to obtain the best possible yield from the resources in the shortest possible time or to achieve their maximum development over the long term. In all cases the application of a cost-benefit criterion seems legitimate; this renders CBA valid as a general principle, although its application is necessarily case-specific. In any event, its content is imbued with value judgements corresponding to the viewpoint. Claims that CBA is an objective and scientific method of evaluation are merely wishful thinking. It is therefore essential to understand from the outset that this is a highly controversial tool.

Thus it is clear that in theory there is no reason why this principle should not also be applied to environmental problems. Experience shows moreover that it has been widely used in environmental policy decision-making and will most probably continue to be used in the future. Nevertheless, despite its more or less generalized use, which has shown CBA to be a feasible and useful support tool, and a necessary one too, the shortcomings found in its application have given rise to wide controversy with regard to the advantages of using it for these types of decision. For example, one of the specific problems which arise in the application of CBA is the tendency to use it in very limited and narrow ways: the scope of many studies is limited to highlighting the pollution problems of an industrial plant or of a determined zone, disregarding the more strategic issues of the development activities of which the project forms part; or the greater problems of regional and urban planning; or the interregional and international implications of the use of certain resources or the dumping of certain wastes for the overall human environment; or the long-term consequences, in terms not only of the environmental effects of an activity but also of the resources which

environmental protection diverts from other uses. Similarly, many studies are limited to analysis of the viability of short- or medium-term options on merely financial grounds, thus ignoring such an essential aspect of the environmental issue as its intrinsically long-term horizon.

Nevertheless, the experience of many years of environmental protection, analysed in the cases described below, has proved CBA to be useful for evaluating specific options in environmental policy decision-making. Already the volume of information available is rendering decisions less uncertain. Furthermore CBA could become an effective way of organizing information and identifying gaps in knowledge requiring research on the economic effects of various development activities. In addition, it ultimately constitutes the introduction of the economic dimension into the analysis of environmental actions.

There is no reason why the environment should be exempt from economic considerations, especially in light of the dramatic shortage of resources in the developing world, where more urgent problems put pressure on scarce fiscal resources. It should be mentioned that this is especially relevant as a means of increasing the degree of quantification in long-term assessments, which are frequently disregarded in CBA for project evaluation.

Moreover, because of the complexity of the problems which must be handled, close interaction is needed between specialists in various disciplines in order for CBA to produce reliable environmental results; this interaction is difficult to achieve but is becoming an increasingly necessary exercise. Let us say at once that "environmental" costs and benefits are not the exclusive domain of the economist and that the difficulty of (or impossibility) of quantifying them does not mean that they do not exist or that they are not integral parts of the economic system.

The prominence achieved in recent times by economic analysis, which environmental protection cannot escape, provides favourable conditions for reinforcing the quality of economic methodologies for calculating environmental quality levels in an interdisciplinary context. This consideration remains important, since CBA has been seen by certain ecological groups as an impediment to environmental protection and as a pseudoscientific proof for justifying the growing and continuous deterioration of the environment. What must be done in this respect is to avoid categorically rejecting the methodologies and instead to make a greater effort to demonstrate their usefulness and overcome their limitations. It will thus be possible to protect environmental quality with more refined calculations.

Such considerations are the outcome of the experience of many countries, which argues for the fact that use of CBA is very widespread and that some governments have even made it mandatory to include some calculation of economic efficiency in all activities relating to environmental protection. In any case, this has not always been accompanied by the introduction of environmental considerations in development projects and plans –the other

side of the coin– and this constitutes an important source of future environmental deterioration. These are two complementary problems of CBA and efforts to improve methodological standards should address both of them.

The question may be raised at this point as to why CBA, which is generally associated with financial and short-term calculations, should have a meaningful application to a comprehensive social and long-term issue such as the environment. The question is pertinent, given the wide controversy surrounding the "ethics" of applying economic measurements to such vital matters affecting the continuation of human life itself on the planet, especially in the light of recent evidence of the catastrophic nature of certain effects of socioeconomic activity on the environment.

The provisional reply, in an attempt to resolve the controversy from within, is to say that without outrightly rejecting the methodology, as certain environmentalist groups have done, CBA should only be considered as a general methodology for economic evaluation of possible courses of action, with a view to choosing the most suitable one. CBA is thus a tool for supporting the decision-making process with regard to the economic effectiveness of options in a broad sense, and nothing more. It is by no means a panacea, but neither should it be a scapegoat. In a world so poor in economic resources for development, no social activity can be exempt from evaluation. But nor can this evaluation omit the specifics of the domain in which it is applied. And the environment is a domain whose characteristics make it of greatest importance for mankind's future.

In any case, CBA is one way of approaching the problem of making choices exclusively from the monetary point of view and it consequently involves the numerical quantification of the advantages and disadvantages of the future performance of an action. Herein lies the distinctiveness of its use as a general principle and assessment method: it introduces as part of the general evaluation process some kind of economic calculation into decisions which may endanger the environment and its functions. This is its limitation and at the same time its contribution to the comprehensive evaluation of an environmental protection measure. It is clear that an approach such as this makes it possible to confront the issue by directly participating in the debate between economists and ecologists, in an attempt to take both the physical and the economic effects into account.

The degree to which certain variables are viewed as costs and others as benefits can produce from CBA radically different results depending on the viewpoint adopted. And this applies equally to environmental CBA. Traditional welfare economics has already established the distinction between private costs and social costs, with the latter not necessarily in conflict with the former but rather complementary to them and calculable from them. In any case, what is not questioned in neoclassical welfare theory is the time horizon of the decisions, which does not extend beyond the

medium term and thus omits an important set of benefits and costs which do not manifest themselves over the short or medium term. But there is no need here to enter into a discussion of the virtues of an approach which seeks, at any cost, a rather dubious theoretical equilibrium in an ivory-tower academic exercise which reduces the problem to a search for hypothetical costs of equilibrium. Hence the need to visualize CBA in a broader way than in the restricted frameworks of welfare theory or financial evaluation of projects.

This is the comprehensive concept of CBA that prevails in this study. In other words, as was stated above, we refer to social CBA in broad terms. Thus it is not the same as mere financial analysis as in project evaluation or welfare economics (Leal, 1985a). Both approaches, however, can be adapted and used to solve a specific environmental evaluation problem limited, as we said before, to concrete geographical zones or social groups. In any case, the objective is always to achieve some kind of monetary expression of the alternatives which have to be studied to make a CBA.

A critical factor will be the time horizon over which the costs and benefits are projected. Controversies caused by certain biased and inconclusive CBA calculations are in many cases due to a failure to consider a sufficiently long-term horizon incorporating all the effects of an activity, many of them strictly economic. Adequate consideration of economic effects is essential in the design of long-term development strategies compatible with a healthy environment.

Another no less important factor to be considered is the global societal aspect. It is impossible to deny the holistic nature of the environmental problem: the broad scope of human actions with respect to environmental quality indirectly or directly affects other social groups apart from those strictly linked to the activity. Thus these actions go far to determine the quality of life of the population. Added to this are the very long horizons over which many effects manifest themselves, the uncertainty that this implies and the systemic and synergistic nature of the effects; in sum, the strategic and long-term nature of the decisions involved. More than ever, these are key concepts in the analysis of environmental problems (Sunkel and Leal, *op. cit.*).

Finally, it must be emphasized, from the outset that CBA does not in any way constitute an exhaustive evaluation of environmental protection measures. CBA is undoubtedly of great relevance but it is only one component of the overall analysis, which must take into account other factors relating to both physical and social effects. No matter how important economic analysis may be, its use as the sole element in decision-making produces major distortions in the complex interrelationships between economic and natural systems.

CBA is an allegedly objective methodology which conceals a considerable number of value judgements. Thus, its use in decision-making is dangerous because of the many possible ways in which it may deviate from its underlying logic. It could thus prove to be more of a hindrance than a help in

decision-making. It must always be borne in mind that the great illusion of CBA as a general methodology is its claim that everything can be quantified in monetary terms, which in turn presupposes that money is a stable unit of measurement to which everything can be converted. The only way to make CBA into a useful decision-making tool is to use it at a defined level of application over a given horizon and within a limited scope. Benefits and costs can then be ascertained for a certain group, territory or process for which benefits and costs make sense. This would be to move away from the view of CBA as an allegedly objective and universal measurement, but it should nonetheless not prevent consideration of the interrelationships which the environmental issue implies, including those linking it to the social and economic development process.

2. Need for environmental protection measures

As was indicated above, the problem of whether to apply CBA to environmental measures arises at the time when society decides to take steps to restore, protect, maintain or improve the quality of its environment. It is clear that, just as environmental deterioration is the outcome of a blind, short-term mechanism, its correction requires a co-ordinated social will and a long-term perspective.

However, when taking this decision society asks itself what the economic consequences of the actions will be: what quantities of material, energy and financial resources will be used, and what will be the future yields of these resources in terms of social welfare and, in particular, environmental quality. In other words, the issue is how to evaluate the overall efficiency of a decision to allocate resources to the measures in question. Such an evaluation ultimately constitutes a comparison with other social allocation alternatives.

Here is the first key problem in environmental economics: the social perspective is not arbitrary or rhetorical when it comes to dealing with problems of environmental deterioration. Decisions which endanger the natural environment are social decisions taken by society as a whole for the collective good, and they represent the interests of the community as opposed to merely individual concerns. The environment constitutes a societal heritage in its spatial (national) and temporal (generational) dimensions. However, there is no reason why such decisions should necessarily conflict with individual interests, but their emphasis is placed on overall social objectives, involving the interests of the majority. Like it or not, it is evident that the history of environmental destruction provides numerous examples of decisions whose net individual benefit (for example for a company) had major repercussions on third parties, who were just as much owners of the environment as those who polluted it.

Moreover the environment, as the concept is understood today, is precisely a matter which concerns society as a whole, although its

deterioration has been caused by a small group and the effects apparently fall upon only a part of society. In addition, concern for environmental problems, in particular the more immediate effects of its deterioration, has expanded notably in recent years and social pressure has been responsible for many governmental policies. Active democracy is part of the reason for this in the countries where environmental awareness is most developed.

There are serious difficulties in ensuring that isolated individuals can understand the complexity of relationships and secure the volume of resources required for overall environmental protection. Each individual will obviously have to contribute specifically to both the planning and the monitoring of environmental processes as well as to the maintenance of a certain level of environmental quality; but policy decisions will be general in nature, and this implies a degree of centralization. Extreme decentralization or "laissez-faire" makes no sense in environmental policy, since individuals would necessarily tend to superimpose their own needs on those of society as a whole, driven by the profit motive, especially in markets, which function in far from ideal ways. Although this is true of any human action, it is especially significant in the case of environmental problems, given their imperfect or total lack of integration in the economic cycle: "free" goods (the atmosphere, a lake), non-existent market prices for certain resources (water courses, refuse dumps), the intangibility of various "natural" goods and services (aesthetic aspects of landscape, silence). All these are examples of real environmental problems, and the current deterioration in these respects is precisely the result of free-market approaches which, moreover, hold to a short-term view that does not even take into account an individual's life span. It is odd that the idealized world of free competition, in which the market supposedly allocates all resources, totally disregards the environment. In all projections it was always considered to exist in such abundant supply that it was not associated with the concept of scarcity. Apparently, the temporal and spatial shortsightedness of economists was merely the counterpart of the vague world-view offered by the markets, where clarity extends only to the here and now.

Among social types of decision, those involving use of the environment cover such a broad range of social interests that they might well be viewed as the most important ones for society's development over the long term. They ultimately mean defining what will be done with nature and to what degree it will be used to satisfy the human requirements of present and future generations. In this context, measures for protecting and improving the environment are actions which, though different in scope, carry out and implement these decisions. There is no doubt that major changes in the environment will result from development projects. But measures which directly affect the environment are a necessary complement for ensuring that environmental resources, goods and services will effectively contribute to the development process.

Environmental protection measures have been the subject of serious discussion in recent years, owing to the concern of governments about the growing deterioration and destruction of the natural and man-made environment. Hence, the dramatic and evident need to check this negative trend in order to control and plan current and future levels of environmental capacity. However, concern about the real economic significance of these measures emerged at the same time. Thus, during the 1960s and 1970s there prevailed a rather optimistic view of the advantages, including economic ones in monetary terms, of social expenditure on environmental control. It was thought that the evidently positive results of measures designed to maintain or increase environmental quality –boosted by the creation of national awareness of the problem– were sufficient to ensure the adequate allocation of social resources for environmental protection. It was a widespread growth of awareness which governments made their own, in a context of democratic vigilance over the actions of the State.

These measures were often supported by cost-benefit calculations, but rarely by complete and accurate ones. It was assumed that direct use of CBA merely constituted lateral support in decision-making, without it having the definitive nature demanded of it for other types of decision. The environment seemed a valid social objective in itself, which must be defended on the basis of absolute principles. Thus, if CBA showed that the (social) benefits exceeded the (social) costs of the protection measure, the next step was simply to choose the best control option in terms of the highest value of the cost/benefit ratio. However, in the majority of cases, the benefits were not even estimated, for they were considered *a priori* to be higher than the costs; this resulted in a comparison of possible alternatives in terms of least cost. In many cases, indeed, a negative CBA was rejected as being irrelevant and the decision was made on non-economic grounds.

This trend has varied greatly in recent years, owing in part to important changes in the world economy as a result of the "oil crisis". Governments have shown increasing reluctance to spend on environmental protection, in view of the pressing nature of other problems considered to be of greater priority: inflation, recession, unemployment, among other negative effects of the crisis. It was then deemed insufficient merely to estimate an intangible benefit or use average values based on past data. Governments required very exact calculations to convince themselves of the advantages of allocating resources for environmental protection. Through an extraordinary manipulation of economic techniques CBAs began to appear with regularity. And proof has been found of their negative results, as formerly of their positive ones. First, incomplete CBAs were accepted in view of the importance of environmental problem and then extreme requirements were made for refinement of the calculations in view of the importance of the other problems. In both cases the action was independent of the quality of the CBA

calculations, demonstrating once again the arbitrary nature of the methodology.

This is precisely the current state of the discussion and it has been passed on to the developing countries as is. Unfortunately, this situation has indirectly had negative repercussions on the environment, despite the apparent improvement in resource allocation achieved by the use of CBA at the moments of greatest faith in its application.

Governments have the tendency, through mimicry, to demand CBA calculations when often there is not even a thorough understanding of its application procedures. This is what has prompted many public, private or community groups openly to reject the use of CBA when making decisions which have impacts on the environment. On the evidence of these calculations actions which are clearly essential are rejected, such as environmental sanitation projects, and an aware or informed public reacts against this. The root of the problem, however, does not seem to lie in CBA itself, but rather in what different people understand by costs and benefits. At bottom, policy options of great scope are at stake. What is essential is to understand that CBA may tend to conceal value judgements and private political considerations behind the facade of a sophisticated economic technique.

The problem, as we see it, is not a question of the simple, *a priori* and outright rejection of methods such as CBA or of their uncritical and immediate acceptance. The consequence would be an additional threat to the environment, something which, no group would in principle be willing to accept, even if profits are lost over the short term, since some of the negative consequences of environmental deterioration are manifested day by day in the health and welfare of all; such a situation would also jeopardize the possibility of designing sustainable development policies.

The crux of the matter is to achieve greater detail and accuracy in the calculations, establish clearly the decision levels involved and make some estimate of the long-term effects. What is required is that the measurement of costs and benefits be founded on premises which are as scientific as possible, in order to ensure that results are economically viable and that the need for balance with other national problems is adequately considered. What is important is to maintain the need for economic evaluation as a component of all evaluations.

As a consequence of this situation, efforts are being made substantially to improve the quality and accuracy of methods of measuring the economic yields of environmental activities. First, there is the impact on industry of the use of antipollution devices, a basic problem in the private production sector. This generates a certain kind and degree of CBA. But the environmental issue also implies other concerns at a more strategic level. For example, besides the traditional pollutants, others have been identified which imply greater risks to health and welfare and which, moreover interact synergystically with each other; at the same time, the problems of the depletion of material and energy

resources have emerged as critical environmental issues, particularly for developing countries; in addition, the aesthetic aspects, with all their implications for tourism, quality of life, mental health, etc., constitute significant problems in societies in which alienation appears to be spreading. This is to mention only a few of the more typical environmental concerns.

In this light, the reconciliation of development and environmental goals is a critical issue. This is a result of the difficulties being experienced by governments in allocating funds for upgrading the environment at a time of growing fiscal constraints and increasing competitive demands for government funds. In this context environmental analysis offers a long-term perspective which is in many cases, omitted owing to the lack of adequate methodological tools. It is important to realize that in many cases, the effects of a measure on the environment greatly exceed the scope of the measure itself and the specific physical environment involved.

The immediate inference from this situation is that governments, when they attempt to tackle these complex issues, should consider some sort of centralized control and co-ordination. Broad consensus has been reached among environmental and natural-resource economists that the adequate use of CBA methods and techniques should entail involvement of some aspects of the overall decision-making process. The different CBA methods could be used to organize the myriad factors which have to be taken into account in decisions affecting environmental quality at the local, regional and national levels, instead of constituting a sole mythical indicator for decision-making. These methods should be complemented by other methodological and technical approaches borrowed from the social sciences and engineering, as is proposed below. Techniques such as environmental impact assessment (EIA), for example, must incorporate CBA, whether to ensure that the CBA is backed up by physical measurements or to estimate the economic effects of EIA recommendations. This seems to be the only way of balancing the complex interrelationships with other sectors, regions or projects which emerge in the analysis.

The issue of applying CBA has evolved from the rather limited "pollution/CBA" ratio to the broader one of "environment/CBA", with all the accompanying implications. And it is in this context that theoretical, methodological and practical work is currently proceeding in this respect. Since there is a need to implement environmental protection measures throughout the entire spectrum of the various dimensions involved in the concept of environment, economic evaluation using CBA becomes more complex and poses great challenges to the nascent environmental management sciences.

B. THE CONCEPT OF ENVIRONMENTAL PROTECTION MEASURE

An environmental protection measure is an activity planned by society to give proper consideration to the reduction, control and ultimate elimination of threats which socioeconomic activities pose to the environment. In a positive sense, they should be thought of as activities intended to place the environment and its potential at the disposal of the development process, on the understanding that its deterioration jeopardizes this process. We know that this situation has been the apparently inevitable consequence of past social and economic development and that it has been manifested in particularly dramatic fashion during recent phases of our society's development; in other words, in the industrialization process, although many of its effects were already detected in the Middle Ages. It is precisely at the time when the negative consequences of this process begin to manifest themselves that the concept of environment itself is born, with pollution standing out as its most evident effect.

Even when intuitively it is relatively clear what environmental deterioration consists of –its immediate effects are at least directly perceptible– it is necessary to search for a more conceptual way of explaining these phenomena. This is particularly applicable to long-term effects, which are difficult to estimate and uncertain, especially as these are precisely the most relevant negative environmental effects. An environmental protection measure is in essence a long-term tool. And it is a tool to be used to combat the many long-term manifestations of environmental deterioration.

The effects of these threats to the environment can be viewed as a reduction of the environment's capacity to fulfil a specific set of functions or roles necessary for sustaining human life. Thus, environmental deterioration can in principle be measured in terms of the negative variation of its capacity to play these roles.

Here we face a greater conceptual problem, which must be resolved before we proceed. In truth, there is no set and final definition of the environment. Any definition adopted will be subject to controversy. Nevertheless, it is clear that any study which intends to set guidelines for evaluating the effects of human activities on the environment requires a working definition of the environment. If it is a matter of evaluation, the question is evaluation of what, how and why. At this point it seems useful to state that the very concept of environment is in general terms a model, a particular way of representing the relationships between the natural and social systems, between man and nature. And when we say model we are referring to its function as a "simulator" of reality, both to interpret and to act upon it. This concept arose out of a negative definition –pollution– and we have moved on to seek ways of acting positively upon reality –environmental management.

From the perspective of environmental economic analysis the question is whether it is possible to arrive at a more or less coherent definition of environment from a scientific standpoint which is useful from a working standpoint. A conceptual framework forming a solid basis for analysis, can be established by organically defining, as proposed above, the set of functions that the environment fulfills in human life. In its most general expression the environment can be seen as the set of surrounding conditions in which a human being lives and from which he obtains the resources for survival. A distinction is generally made between natural environment and man-made environment, the latter being the natural one transformed by human activity. We may, in any case decide not to distinguish between these categories and talk about the environment in general, since it can be argued that the fact of analysing nature from the point of view of human society implies in some way humanizing and socializing it, and the distinction becomes unnecessary. It would have to be emphasized that the modern concept of environment does not make it synonymous with nature, as could be deduced from what has been said above. In fact, what is understood by environment is a particular way of viewing the relationships between man and nature. In this sense, we repeat, the environment is a model, a representation.

Moreover, the concept is a new one, generated in response to the dramatic effects of technological development and industrialization on the relationships between human beings, other living beings and the physical world. There are many examples: water pollution, with all its repercussions on human health, on animal and plant life, on its use as a resource for fisheries or industry itself, etc.; the destruction of natural landscapes which increasingly confines life to urban centres that are becoming unbearable; and the accelerated depletion of certain scarce natural resources, use of which we are irreversibly denying to future generations. All these environmental problems are related to concrete characteristics of industrial society, although their origins go far back, sometimes to very remote stages of civilization's development. Their status as "environmental" problems, however, is a contemporary phenomenon.

In any case, our problem is to search for ways of dealing with these problems in the context of socioeconomic issues, which constitute a given reality upon which it is necessary to act.

1. Functions of the environment

The functions of the environment, as defined above, can be summarized as follows:

a) *The environment as a provider of resources*

The environment supplies human beings with the *natural resources* –both material and energy– required for producing the goods and services

necessary for maintaining and developing life. These natural resources can have different characteristics, and various categories have been proposed for their analysis. Already, there is a fundamental distinction between material resources (raw materials for the production of goods and services) and energy resources (which supply the energy necessary for transforming these raw materials). The resource issue constitutes the basic environmental issue, and thence derives the entire structure of the environmental sciences.

According to Pearce, Seneca and other environmental economists, environmental resources –material and energy– can be grouped into four types of resource (Pearce, 1976). The proposed classification is shown in figure 1, which also establishes the relationships between the resources.

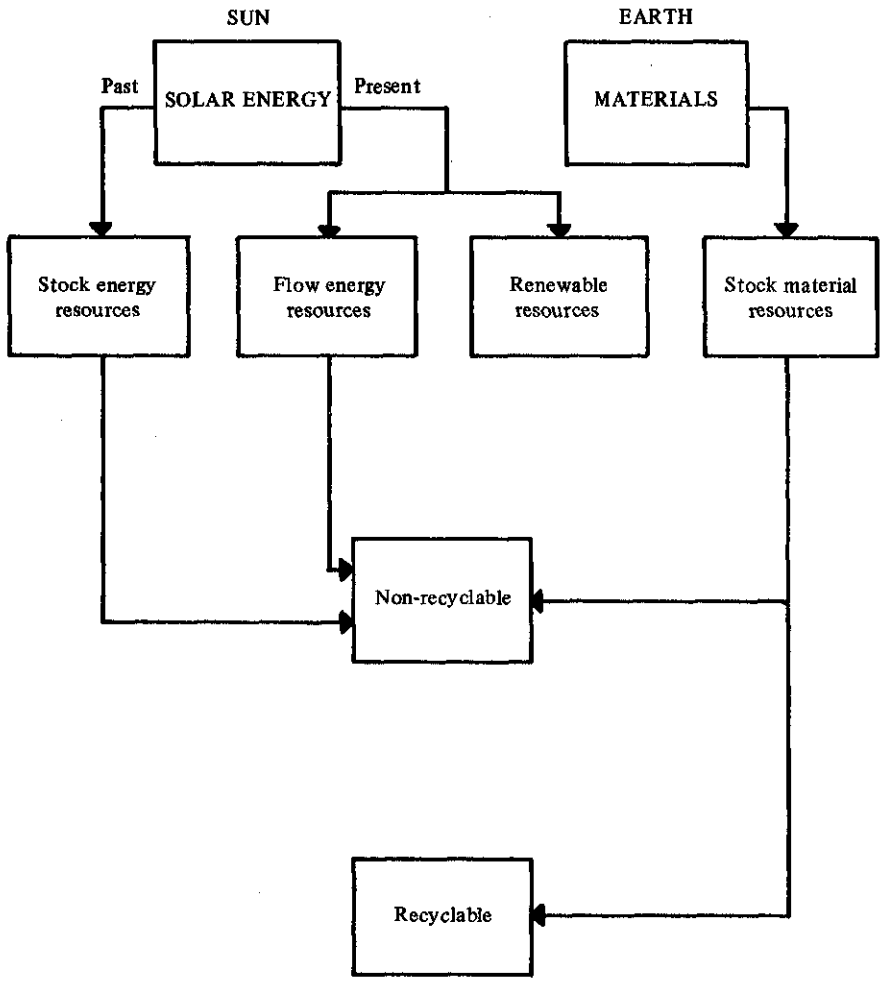
CLASSIFICATION OF ENVIRONMENTAL RESOURCES

For the purposes of the economic analysis of this first function of the environment (which, we repeat, is to provide natural resources which are extracted to be transformed into goods and services), these resources are usually marketed for their final or intermediate consumption. Many of them, though not all, in effect command a market price as an expression of their relative scarcity. Others do not. Thus, direct solar energy is a resource which at the moment is not marketed and thus has no price. If it was marketed, its price would be zero, unless facilities were constructed for storing this energy. Tidal or wind energy is a similar case in point. This is a specific example of "market failure" and in some cases even of the non-existence of a market as such. This will be a key factor in dealing with certain evaluation problems considered below.

The way to approach the overall analysis of this environmental function is to use materials/energy balances and input/output analyses. These balances provide an ecological view of the environmental issue, for they are based on physical and biological laws. We should remember that ecology, as a science, is concerned precisely with the relationship or interrelationship between living beings, both among themselves and with the environment. This relationship between biota (system of living things) and their surrounding environment is what is known as an ecosystem. Materials/energy balances are an expression of the flows within ecosystems and are not confined to resource analysis but cover all environmental sources (Pearce, *op. cit.*) (Torres and Pearce, 1979). Input/output analyses show how certain resources come to contribute to given processes, involving specific products (including certain undesirable by-products, such as pollutants). Thus, demands for a given resource from a producer or consumer are related as far as end demands. Various authors have worked on broadening and adapting input-output matrices to include environmental variables (Victor, 1972). In theory, these

Figure 1

CLASSIFICATION OF ENVIRONMENTAL RESOURCES



matrices could encompass all resources, and pollution problems could be included by establishing a special "antipollution" sector.

An interesting approach to this problem has been developed by Ayres and Kneese in their model of material balances, where they have demonstrated that disregarding the typical emissions into the environment, of production and consumption processes ultimately means denying the laws of conservation of energy and matter (Ayres and Kneese, 1969; Kneese, 1977).

b) *The environment as provider of natural goods and services*

Landscape and cultural heritage can be considered as *intangible* "natural" goods and services which the environment provides to support human life, contributing to the quality of life and making it pleasant and full. This includes, for example, scenic beauty, pure air, absence of noise, etc. These are not material resources, and their quantification is therefore especially difficult owing to the subjective factors which influence their assessment. The greatest difficulty seems to lie in their tacit status as collective property; this makes it impossible to establish a private property right to them, so that there can be no prices or price-generating markets. This is the most complex part of the whole evaluation process, particularly with regard to the relevance or irrelevance of conservation as a function of development, and to the importance of the cultural heritage *vis-à-vis* the needs of modernization and progress.

Analysis of this function is essential if the real demands for recreation and conservation are to be met. These demands exist, even when in many cases the market does not price the goods. Nonetheless, some "shadow price" should exist, expressing the participation of this function in the market. It appears very clear in this case that the quality levels of these goods and services cannot be regulated by an overall market, for it simply fails to allocate these resources.

There is an additional difficulty: in many cases a contradictory situation is created with respect to the environment's function as provider of resources owing to the alternative use of the environment to fulfil some other function. In these cases a trade-off is required between the functions in order to find an optimal solution satisfying the requirements of them all. It should be pointed out that this is a result of the balance and interrelationship between all the functions of the environment, as we shall see below.

c) *The environment as assimilator of waste products*

The environment provides human beings with a *capacity to assimilate* the waste products of economic activities, i.e., a capacity to accept the emission of wastes by production and consumption activities. The environment could be described as a "sink". Pollution can thus be defined as the effect of exceeding the environment's natural capacity to accept wastes. This capacity can be

measured more or less objectively by ecological indicators for estimating the environment's capacity to absorb changes. On the other hand, when a pollution process occurs, we are in fact preventing the environment from being used for other purposes. For example, if water-courses are allowed to be used as municipal or industrial sewers, we are in fact limiting or preventing their use for fishing, irrigation, swimming or recreation, both as productive resources and in their aesthetic aspects. Non-assimilation of wastes then becomes degradation of the environment as a whole. Economic analysis of pollution should, therefore consider material and energy losses as well as damage to the overall welfare of society, as expressed in the availability of goods, services and resources provided by the environment.

The interrelationship between environmental functions is thus very clear. A process which implies exceeding the absorption capacity of a given environment implies, as an additional outcome, preventing the latter from being used as a natural good or service and limiting its capacity as a resource provider. The environment is a system and its functions are interrelated in a complex way, being separable only by analytical methods. The problem is made clearer by use of an energy/materials balance, such as the one presented in figure 2. This diagram shows a relationship between the economic system, with its production and consumption activities, including a separate recycling activity, and the environment, with the function described above (Seneca and Taussig, 1974; Pearce, *op. cit.*; Torres and Pearce, *op. cit.*).

2. Matter and energy balances

Economics traditionally regards the consumption process as the end, the culmination, of the economic process. Supposedly, the resources which help to increase the welfare of consumers also end there –welfare being understood only in terms of consumption. This opportunity for consumption is achieved through the resources provided by the environment, which flow to production sectors where they are transformed into "economic" (consumption) goods. These materials are merely a part of the various resources obtained from the environment and combined into usable goods. Energy resources are used in their transformation, and indeed make the process possible.

According to the first law of thermodynamics, it is not possible to create or destroy these natural or original resources. We are only capable of transforming them, so that the resources which flow to the production sectors must, in their entirety go somewhere once they are converted into useful goods and services. It is clear that certain goods enter the consumption process and others are used as capital goods, remaining in the production sector. But a part of these resources will be discarded as wastes or emissions and returned to the environment. This applies to both material and energy resources. The consumption process, also discards a part of these goods as

refuse. Finally, it may happen that some of these discarded elements (from both production and consumption) are reused (recycled), but a residue always remains which is definitely returned to the environment. It should be pointed out that energy is not recyclable, since it is unidirectional and requires a permanent source, which in the case of ecosystems is solar energy –by virtue of the second law of thermodynamics.

In summary, figure 2 shows that everything taken out of the environment in the form of physical resources must theoretically reappear in it with the same weight, whether as consumption goods or, in more general terms, as goods necessary for maintaining vital processes, or as wastes. This amplified view of the economic process means that consumption is no longer the endpoint; instead, the process is broadened to encompass the unconsumed and discarded part.

Taking an overall view of these functions, we can say that the environment fulfils the general function of a life-support system for humans (a host to human settlements). In this sense it is a complex and dynamic system which provides the means for supporting all forms of life. This general function combines and integrates certain specific functions, which are interconnected with each other and inseparable.

THE MATERIALS/ENERGY BALANCE

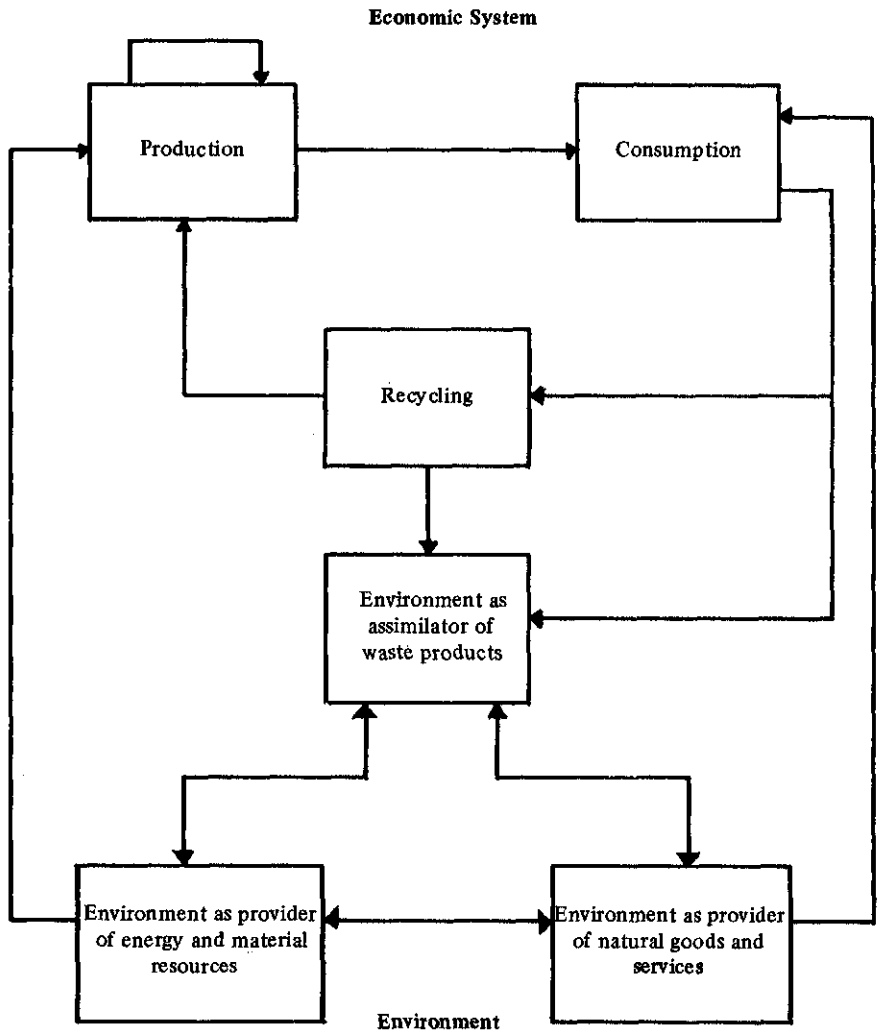
3. Categories of environmental protection measure

It is clear that there is a close relationship between a certain level of environmental quality and the social and economic development process. It is precisely for the purpose of conserving, restoring or improving the environment's capacity to support the development process, especially over the long run, that an environmental policy has to be designed and implemented. These policies may be designed in varying degrees of detail to deal with different aspects of the environmental issue. Thus, they can be confined to a single specific environmental protection measure intended to solve a particular more or less priority problem within a limited time-frame. They can also be comprehensive in scope and constitute an environmental plan, which by definition is a long-term activity.

Before selecting a possible measure and its technical and economic options it is necessary to identify which environmental functions will be affected, using an approach such as the one presented above. Together with this identification, the principle interactions with other functions have to be established. The cleaning of a river flowing through a city or the determination of policy for a mineral resource are not the same as preserving a monument or identifying an endangered species. While all these are

Figure 2

BALANCE OF MATERIALS AND ENERGY



environmental problems, they differ in scope and repercussion on the social structure and their solution will have different economic consequences.

In any case, the concrete manifestation of an environmental policy is its actions or measures, which can be grouped into three main categories, depending on their objectives: *control or conservation* measures; *reclamation* measures; and *environmental improvement measures*.

a) *Control or conservation measures*

This category of environmental measure is concerned with avoiding additional damage to the natural environment when it is subjected to some sort of stress as a result of human activity. Likewise, these measures seek to protect it from potential damage from new human activities –industrial or infrastructure projects, for example.

b) *Reclamation measures*

When part of the environment's capacity has deteriorated owing to the effects of human activities, a reclamation measure is needed in order to restore the value of the environmental function in question.

c) *Improvement measures*

These measures are intended to upgrade environmental quality. They differ from the preceding categories of measure in that they do not start off from a situation of deterioration; instead they aim at improving the existing levels of environmental quality, which could be very low owing to climatic factors (a desert, for example).

As a preliminary conclusion, when studying a measure it is important to take its category into account. The economic evaluation is very different in each case, since what are regarded as costs and as benefits could even be reversed, depending on the measure. A clear identification of the measure's type is an indispensable requirement for its correct evaluation.

4. Types of environmental protection measure

The implementation of procedures and instruments can be very different for the various categories of measure described above. In fact, they will depend to a large extent on the different types of institutional structure in a specific society; this means that the decisions are necessarily affected by political options. Thus, a specific type of measure cannot be selected merely on the basis of technical considerations, since these might conflict with the instruments of policy available and acceptable in a given social organization. In other words, the administrative structure, the development style and the organization of the State in a country will determine the selection of the best type of measure for the use and protection of the environment. In more

concrete terms, the extent to which planning mechanisms are used will be crucial in the selection of specifically environmental support instruments. We have already established the shortcomings of market mechanisms and the mandatory active participation of the State in environmental matters. Indeed the discussion of "types" of measure is delimited by the scope and nature of State action.

On the other hand, there are some problems which are basically methodological in nature. Selecting the best method for supporting decisions will depend, as far as their feasibility is concerned, on the specific level at which the decision-makers are operating. These decisions may take different forms and produce economic effects which differ in scope. *Strategic* decisions, for example, relate to the functioning of the socioeconomic system itself, so that they cannot be based on quantitatively or qualitatively biased information. These decisions are broad in scope, relate particularly to the long term and are taken at the top levels of the political-administrative hierarchy. They are quite unlike decisions which may be classed as *tactical* (valid especially for the medium term) or *operational* (everyday ones). The descriptions given below will clarify this point.

In any case, it is evident from everything that has been said so far, that CBA can be applied to all types of measures and at any level of decision. However, the specific manner in which it can be applied and the particular cost-benefit matrix for each type of measure, will be determined by selection of the most adequate method in the light of prior analysis of the measure's main features. Descriptions of the main types of environmental protection measure are presented in the following paragraphs. It should be noted that this classification is essentially analytical, and that frequently in practice, the measures to be taken will show simultaneously features corresponding to the different types outlined below:

a) *Taxes, subsidies and standards*

The establishment of a measure for controlling present and future damage to the environment by a specific human activity may involve a *taxation* system. The idea is to force agents causing environmental damage to pay the rest of society for the loss which their degradation of the shared environment means to society. This payment can be collected through a taxation system, the revenue from which will end up in the hands of the State, which will be responsible for using these resources to finance activities for upgrading environmental quality. This might mean a sewage treatment plant, a system for periodically monitoring vehicle exhausts, or the reclamation of a degraded recreation area.

This payment is calculated by means of some *standard* or scale of standards representing the levels of payment to be made directly or indirectly. The tax amounts are assessed by means of optimization calculations based on

neoclassical economics. Thus, environmental problems resulting from economic activities are seen as *externalities or external diseconomies*, which affect the agents of the process and on which they cannot act. They are certainly negative externalities causing environmental deterioration and damage. There will be cases in which development projects or activities will mean environmental improvement, in which case they would be positive externalities. In such cases the tax is replaced by a *subsidy*.

In principle, taxes and subsidies should be equivalent to the damage or improvement, respectively, associated with the externality. It is first necessary to determine a *pricing system* for the assignment of economic values to possible taxes and subsidies to be applied to environmental changes. The next step is to establish a *rates system* (for taxes or subsidies), which will also require the design of a *system of standards* of environmental quality. These standards are (upper and lower) limit values for the use of environmental functions in specific activities. Any specific use of these functions in excess of the accepted upper limit must incur the corresponding tax, or it will receive a subsidy if below the prescribed ceiling. Standards are generally the expression of the environmental quality levels desired by society. Their definition is a matter of environmental policy. This does not preclude the existence of scientifically defined levels which establish limit values for gas emissions, pesticide use, resource availability, etc., above which there are environmental effects.

There are different types of standard. It should be noted that protection measures have been traditionally designed to solving industrial and urban pollution problems. However, their application to other environmental functions is perfectly possible and consistent. The main groups of standards are as follows:

i) *Product standards*

These standards define the characteristics of a product which is authorized for market trading. This type of standard may relate, for example, to the nature of a given manufactured product which causes pollution or is harmful to health, or to national policies regulating the use of scarce natural or strategic resources. Examples of these standards are the control of lead in gasoline, or phosphates in detergents, or DDT levels in dairy products.

ii) *Emission standards*

These standards define the amounts of pollutants which an economic activity –industry, means of transport, construction– may discharge into the environment. Their values are related to the environment's capacity to assimilate wastes and specific scientifically defined emissions. The standard does not have to coincide strictly with what is biologically acceptable, for example, but any deviations –determined by environmental policy– should be considered in the analysis. Examples of these standards are SO_2 levels in

gases, amounts of dust or ash emitted, noise levels from a specific sound source, or the quantity and quality of solid wastes discharged into water or ground.

iii) *Process standards*

These standards determine certain characteristics of production activities. They may relate to production processes themselves or to the nature of the action which must be taken with respect to the specific location of the production operation. All environmental functions can be controlled by means of these types of standard. As examples we can cite the acceptable temperature levels in a process, the noise level produced by a plant, or the use of personal tools in the work place.

iv) *Environmental standards*

These standards define the overall characteristics and quality of a given environment. Examples of these standards are: SO_2 content in the atmosphere of certain urban areas; chloride concentrations in river water; or levels of dissolved oxygen in domestic drinking water.

The first three types of standard have to do with *specific activities* and are used directly to eliminate the externality. The fourth type represents a *social aspiration* for specific levels of environmental quality, which can be achieved through various mechanisms, including the three preceding types.

Establishment of a system of standards has been the most-commonly used type of environmental measure up to now. Doubts as to its effectiveness, have been raised in various circles on scientific, economic and political grounds. A general criticism is leveled at such a system's *ad hoc* nature, on the ground that this prevents it from taking into account the impact on the socioeconomic system as a whole.

b) *Prohibitions*

This type of environmental measure involves decisions prohibiting the use of certain places and the use or exchange of certain products.

The consequences of this type of measure have generally been described as dangerous to the national economy. They are apparently, anti-economic in nature, in the sense that their use is based on non-economic grounds, such as ethical, aesthetic or health grounds. From the point of view of environmental functions, prohibiting the use of one of them can be interpreted as a type of protection of its capacity. However, this could lead to non-optimal situations from the point of view of the whole global function; for example, the total capacity to absorb various waste products (in quality and quantity).

It seems evident that in certain cases involving substances highly dangerous for the environment and human health, such extreme measures are understandable and even necessary. In any case, in the rational allocation of environmental resources such measures should be viewed as transitory. This

situation would subsequently have to evolve towards some optimal level established by the overall economic policy.

Examples of this type of measure are regulations governing the siting of certain industries, especially those which emit serious pollutants (mercury, arsenic, lead, etc.), the prohibition of urban traffic in certain areas or the use of DDT in agriculture.

c) *Public programmes and investments (environmental planning)*

This type of environmental measure results from the willingness of governments to undertake specific programmes and projects intended to protect, restore or upgrade environmental quality in certain areas or sectors. In practice, the complexity of this type of measure makes them true environmental policies encompassing various actions, even specific "environmental plans".

Examples of this type of measure are zoning, programmes for combating the eutrophication of lakes, the creation of green belts, reforestation campaigns, waste treatment projects and the construction of recycling plants. One special case is the organization of operational units designed for integrated environmental management at the national and even international level.

d) *Environmentally-oriented regional planning*

A more complex and comprehensive type of environmental measure involves the incorporation of environmental policies in regional planning. The basic principle underlying these measures is that protection and promotion of the environment can be achieved through rational use and management of physical space. This requires a clear understanding of the relationship between a scientific spatial structure and environmental quality. Once these interrelationships have been established, it is a matter of choosing the most suitable type of spatial structure for avoiding environmental deterioration and for securing optimal use of environmental capacities.

e) *Development planning*

This is the most comprehensive and broad approach to the design and implementation of environmental measures. In addition to the spatial aspects of environmental planning (regional planning), it includes aspects of economic and social planning. In a nutshell, this approach means including environmental policy in the overall development planning process, with special emphasis on the long-term perspective. It thus implies recognizing that society and environment constitute two closely linked systems. Therefore, environmental quality is a concept which extends beyond pollution or resource-use problems. Rather, environmental quality levels are the outcome

of a complex interaction of many factors, some of which are basically socioeconomic and others predominantly natural.

In this context environmental protection, promotion and development depend on the specific allocation of resources, which implies taking the environmental dimension explicitly into account in decision-making.

Environmental policy will thus be a combination of these types of measure, emphasizing some and not others, according to the specific features of national development patterns (UNEP, 1979b).

C. THE EFFECTS OF ENVIRONMENTAL PROTECTION MEASURES

Once a given type of measure has been established as a means of resolving a specific category of threat to the environment, a series of socioeconomic reactions is produced in response to the allocation of social resources to this activity. Basically, all economic activity will have to adapt itself to the protection measure in question. This adaptation means re-evaluating the resources which have already been allocated and defining new criteria for future allocations.

The analysis of the effects of environmental measures constitutes an important dimension of the overall evaluation process. Many of these effects cannot be included in the calculation of costs and benefits, given that they cannot be reduced to monetary terms. This makes CBA a rather limited source of material for overall evaluation. The incorporation of these considerations in the integrated analysis of protection measures requires resort to complementary environmental management procedures which are capable of bringing out these effects, which, while also economic, are not easily quantifiable, at least at the current stage of economic science.

The effects of protection measures on the structure of the economy are many and various. These are the main ones:

1. Income distribution

The economic effects of environmental measures on the various categories of individual in society differ from each other. They depend on income levels, i.e., on participation in the national income. Thus, cost-benefit values associated with different individuals or groups in society have to be compared and weighed in order to maintain a given income distribution, provided that national policy seeks to maintain this particular distribution. Thus, for an unskilled worker who receives a very low relative wage, payment for improved environmental quality will in most cases, constitute an unacceptable reduction in his income. In this case, the environmental measure would have a regressive influence on the distribution of wealth. However, this influence could be positive when the measure aims at restoring to consumers

environmental goods or services of which they had been deprived, as a consequence of environmental deterioration. But these are simplistic and extreme situations. The estimation of this effect is very complex and of great importance for environmental policy. For example, a certain consensus has been reached regarding the "polluter pays principle" (PPP), which seeks to prevent the situation where those who are the direct or indirect victims of environmental damage pay by financing the protection measures, generating the regressive effect on income distribution indicated above; instead, this principle seeks a system which forces the perpetrators of the damage to bear the total cost of making it good.

2. Employment

The effects of environmental protection measures on employment levels have not been clearly established, although some attempts to do so have been made in recent years. It is generally considered that the effects are, both positive and negative. Thus, in the first stages of application of a measure, involving the establishment, operation and maintenance of units or control regulations, jobs are created to perform these new activities. However, this trend is followed by a subsequent reduction in employment, owing primarily to the retardant effect on economic growth of the higher prices for goods and services. This is because environmental protection costs are added on to production costs. What is important in this case is co-ordination with national policies designed to increase employment levels and reduce real unemployment, in an attempt to determine the critical levels, if they exist, at which the effect comes into play.

3. Balance of payments

The effects on the balance of payments are generally, not very significant, although they could have some weight in countries with a structural shortage of foreign currency. The effects depend on the origin (local or imported) of the goods and services used for applying the measures: for example, materials, energy, equipment, manpower. A typical example of a negative effect on the balance of payments is the transfer of so-called non-waste and low-waste technologies, which are currently offered in the market as modern, efficient and environmentally clean, as opposed to the dated, inefficient and polluting technologies of the past. The subject is controversial but it can be said that, apart from the many positive effects which these technologies may have, they make demands on the weak import capacity of these countries.

4. Industrial structure

Two of the greatest effects of environmental measures on industry are additional costs and restriction of the freedom to pollute and use natural

resources. For industrial companies, expenditure on prevention, monitoring or elimination of pollution automatically becomes part of the cost structure. Thus, the natural tendency, from the viewpoint of private rationality, is to add these costs to the prices of the goods and services produced and consequently pass them to the consumer, who will be the one who pays for environmental measures in the end. This issue is controversial and its solution depends on policy considerations in decision-making. Restriction of the freedom to pollute and use resources means the publication of rules or ordinances on the siting of factories and warehouses, use of processes, raw materials or energy sources, production and consumption of certain goods, etc. (I.C.C., 1980).

5. Technology

Experience in the application of environmental measures has shown that the effects of technological development are generally, positive. The need to recover the expenses and productivity losses associated with environmental measures has amounted to a challenge to improve and modernize the processes and techniques for maintenance of efficiency levels.

6. Inflation

The overall effects of environmental measures on price structure have been shown to be negligible. However, some individuals or groups of individuals may be significantly affected by specific price increases. The importance of the effect of protection measures on these increases has given rise to bitter debate. Many economic agents, particularly private companies, have pointed out that one of the causes of the inflation in industrialized countries over the past few years has been the growing expenditure on environmental control. This is understandable, since many private companies are indeed sensitive to changes in the economic context which could jeopardize their current operations and future development; this is particularly relevant when the markets in which these companies have to operate are affected by major uncertainty. The controversy arises, however, when the results obtained by various governments are analysed and show that the real inflationary effect of environmental protection is minimal. In any case, it is evident that much research is still needed on the subject.

7. Growth

The effects of environmental measures on economic growth have been described as essentially marginal. Although there is some effect in the last stages of policy implementation, especially in the case of overall policies involving different types of measure, it cannot be directly assumed that they have helped to aggravate regressive processes. Recent studies have even shown that environmental measures might be viewed as easing the recession.

This would be due to their capacity to stimulate additional demand in some sectors, producing an expansionary effect on the economy. In any case, this discussion of growth is offered from the perspective that the growth process and technological development are inevitable, that they are positive in themselves, despite the simultaneous consequence of qualitative and quantitative increases in pollution. It should be noted that this inevitable trend has been at least discussed in certain academic and international circles. Thus, growth does not have to be considered as the only possibility of development. All the controversy surrounding the discord between growth and development and the new patterns or alternative styles of development has focused on this matter.

8. Urban and rural development

Implementation of an environmental policy could place a burden on certain specific economic agents, with the result that some sectors, regions or branches benefit while others suffer. This is evident in actions affecting urban areas in which environmental problems can be more intense. The measures could have the effect of diverting investment to rural activities or backward regions. This would give a boost to rural development and decentralization, which in principle appears to be a positive effect.

To summarize, we can say that the entire discussion as to the effects of environmental measures is very relevant to the determination of correct and successful environmental policy. This is also one of the main aspects of the discussion of the limits to use of CBA in environmental decision-making. In many cases an adequate analysis of effects is much more useful as a basis for decision-making than a dubiously calculated CBA, which can lead to erroneous conclusions. What is needed is to achieve the ideal situation of combining both analyses in an additional attempt to develop more reliable overall evaluations, which help to overcome the limitations of the use of each analysis in isolation.

Thus, Environmental Impact Assessment (EIA) constitutes a useful tool to help managers gain a proper understanding of the *physical* effects of projects on the environment, while CBA is basically an evaluation of the economic consequences for the socioeconomic structure as a whole.

D. EVALUATION OF ENVIRONMENTAL PROTECTION MEASURES

Environmental protection measures are ultimately designed to optimize *social welfare*. In other words, their objective is to raise society to higher levels of welfare, ensuring that this is the optimum. This optimization will depend, among other factors, on a given level of environmental quality and it means that once a certain level of quality is attained it cannot be improved by

additional environmental measures. Although this optimal level is a theoretical concept, unattainable in any real socioeconomic structure, the search for it constitutes the dynamics of all evaluation processes. In this context, the problem of CBA use relates precisely to this need to act in terms of optimization patterns (Ahmad and Leal, 1980).

As already stated, the underlying reason for implementation of environmental protection measures is that economic activities involve past, present and/or future degradation of the environment. This results in certain necessary costs to society for restoring, maintaining or improving its quality. These costs are closely linked to the damage which the environment has suffered, is suffering and may suffer from the effects of production or consumption activities. This is what is referred to as *environmental damage* and the corresponding costs are *environmental damage costs*. In this context, the purpose of protection measures is to reduce or eliminate environmental damage within the framework of pre-established policy, i.e., to achieve a socially defined level of environmental quality.

Implementation of such a measure will necessarily require use of resources. These resources also involve a set of specific costs which are generally referred to as costs of *environmental measures*, since they only occur when the possibility arises of putting corrective measures into practice.

These two basic categories –*costs of damage* and *costs of measures*– can be seen as the starting point of the calculations when CBA is used to evaluate environmental measures. They are both very general categories but they do allow the two main negative flows of resources –including monetary expenditures– to be separated from environmental activities: flows connected with reduction or elimination of environmental damage and flows connected with implementation of these measures. These categories are very useful, since they allow a distinction to be made between the most important costs of decisions regarding the environment right from the start. These categories should be considered differently when dealing with the calculation and estimation of the costs and benefits of a specific measure. It is precisely in these cases that the categories and types of the environmental measures described above become significant.

Environmental damage costs are generally regarded as benefits, since their reduction or elimination automatically translates into increased social welfare. This applies to all the categories of measures described above, except for environmental improvement ones, which do not necessarily involve environmental damage but rather an enrichment of its quality, which is a direct benefit since the capacity of environmental functions is increased. In summary, environmental damage costs are benefits in terms of *damage eliminated or avoided.*

The focus is reversed when evaluating projects or activities which imply potential damage to the environment. In these cases, the costs of future

damage associated with the project are real costs, which must be regarded as negative in the evaluation of the project or activity.

The optimization process, in terms of social welfare, does not end with the cost-benefit categories described above. Considerations of environmental quality and overall quality of life are other factors which must be included in the determination of costs and benefits. Thus, there are other cost-benefit categories which are not directly linked to environmental problems as such, but which are affected both favourably and unfavourably by protection measures. In other words, the move from a framework of partial balance, concerned exclusively with the effects of a measure, to a broader framework involving other aspects of social welfare introduces another group of costs and benefits which are used to establish the supposed relationship between a certain level of environmental quality and social welfare.

It must be pointed out that in many cases some sort of macroeconomic calculation can be used as a substitute for environmental calculations as such. Thus, through the concept of consumers' "willingness to pay", in this case to pay for environmental protection, it is possible to estimate indirectly some cost-benefit relation of a protection measure. In any case, given the ambiguity and vagueness of the concept, its usefulness is doubtful from a working point of view, although its integrated use with other categories of directly or indirectly quantifiable costs may contribute important elements for CBA application.

It appears clear from what has been said that the search for optimization does not confine the calculation only to environmental considerations; instead, the more comprehensive framework of social welfare must also be taken into account: environmental quality is one component of the quality of life, a term used to define a certain level of social welfare.

E. COST-BENEFIT ANALYSIS

All the environmental functions identified above have limited potential capacities, individually or in combination (see figure 2), which can be used in different ways by society. Thus, the reduction of the capacity of these functions will necessarily imply a lowering of environmental quality. This degradation of environmental quality will consequently bring about reductions in the quality of life, economic welfare and social welfare. Moreover, it is not only current welfare that is diminished, but also the potential welfare levels of future generations, owing to the long-term environmental effects of many economic activities.

This complex chain reaction is due to the lack of an inexhaustible and permanent supply of goods, services and resources normally provided by the environment, which are precisely the concrete products of the environmental functions described above. The fact that these environmental goods, services

and resources are not available in sufficient quantities is a consequence of the reduction in the capacity of these environmental functions to satisfy social needs. In this way the degraded environment becomes a threat to sustained long-term social and economic development.

This indicates that management of these functions is not only a methodological problem but also an essential aspect of environmental economics. This is the underlying issue in the discussion of evaluation methods such as CBA. In other words, the economic problem can be formulated by stating that the environment has certain basic functions and limited capacities which must be used efficiently. These capacities have been used by societies throughout man's history on earth, in many cases with dire consequences. The cause has been the misguided and anarchic use of these capacities, by considering them to be unlimited. This is aggravated by the use of systems for evaluation of these capacities which have proven to be unsuitable for dealing with environmental goods, services and resources –the products of environmental functions. A crucial reason for this situation has been the assumption that environmental functions have inexhaustible capacities and that their products can thus be regarded as free goods, services and resources.

From the perspective of the scientific management of these functions, the objective of protection measures is to bring about voluntary and controlled changes in the capacities, in cases where these have been reduced or are threatened by the effects of human activities. All negative types of alteration of the environment (pollution, depletion of natural resources, destruction of landscapes) or positive types (reduction or elimination of damage, rational use of resources, aesthetic upgrading) generally bring about important changes in the possibilities of using potential environmental capacities. In this context, CBA seems to be an adequate method for evaluating the economic feasibility of the various options of such measures. This evaluation only makes sense if it is done in terms of overall societal objectives regarding the use of environmental functions. On the other hand, CBA helps to meet the need to ensure true economic effectiveness in the application of protection measures.

This highlights one of the main features of CBA in its application to environmental measures. Cost-benefit calculations cannot be confined to purely financial considerations. Nor can they be limited to those cost-benefit categories which are directly quantifiable. CBA is far from being a simple assessment of the monetary advantages of a measure. Such an approach disregards many important factors which in effect constitute costs and benefits but which do not fall within the financial framework. Costs and benefits should be defined according to the effects of the measures on the respective functions to be protected, restored or improved. And for this reason it is fundamental first to analyse the specific environmental functions upon which the measure will act.

A question which ought to be raised is whether CBA is in fact the best way to deal with this type of problem, especially in those cases where the advantages of an environmental protection or restoration action are clear and evident from a social perspective. No one could doubt that certain decisions which are conducive to ensuring clean air, or water fit to drink or for recreation, or wildlife conservation, or improving health standards, etc., are desirable and suitable options from a social point of view. In the light of these arguments, a possible approach to the problem would be to consider environmental protection as absolutely essential and thus accord it maximum priority at whatever cost. The consequence in policy terms would be that society would have to implement all kinds of protection measures without concerning itself about the consequences of these resource allocations or about the possibility of alternative allocations. Conversely, it may also be thought that all the advantages of protection measures are not a matter that should be dealt with socially. This means that environmental protection is only one among many socioeconomic problems. Environmental protection should therefore compete for scarce societal financial resources on an equal footing with other allocation options. The conclusion is that if protection measures are not financially profitable they should be abandoned in favour of other allocations. Both positions are evidently far from being economically rational and belong more to the spheres of ideology or religion than to science. On the one hand, fanatical conservationism views the environment as a kind of paradise garden where something as immoral as economic calculation cannot be used. This position merely ignores the reality of the scarcity of a country's resources, as well as policy, social and economic limitations. Moreover, it could reinforce the traditional view of the environment as a provider of free goods and services, which has been one of the major causes of the present state of environmental destruction. On the other hand, a simplistic attitude of indirect allocation through the invisible hand of the market which views environmental capacities as merely some commercial goods and services among others, in fact threatens the life of future generations, since no consideration is given to the long-term effects of actions on the environment, in addition to the unfeasibility of creating markets for these resources. It should be added that current environmental economic quantification is not sufficiently developed, and that these resources would enter the market at a disadvantage and certainly undervalued owing to the impossibility of accurate pricing.

Instead of these extreme positions, modern environmental economics stresses the idea that environmental goods, services and resources, in all their functions, should be marketed, i.e., they should have a price although it may not always be a very accurate one. This price, however, should be monitored by a centralized agency or determined in a planned manner. It would thus be possible to take into account environmental problems, their economic consequences and overall societal objectives in this matter. This seems to be

universally valid and the emphasis on market or planning considerations will depend on the overall economic system chosen by society.

This shows that, in order to obtain accurate cost-benefit calculations or estimates of measures, we need to know the prices of the goods, services and resources provided by the environment. Some of them can be calculated more or less precisely; others will merely be estimates or will operate within a range with upper and lower value limits; and some of them will certainly remain intangibles. However, the greater the degree of quantification, the greater the possibility of having real cost-benefit categories for the evaluation process (Coomber and Biswas, 1973).

F. COSTS AND BENEFITS OF PROTECTION MEASURES

In order to orient the evaluation process, a set of basic categories can be proposed for dealing with the problem of cost-benefit calculation. These are basic categories which attempt to encompass as much as possible of the total spectrum of alternative definitions of these costs and benefits, without the categories constituting a strict model.

In accordance with our earlier proposals, two overall cost categories may be used to begin the analysis: *environmental damage costs* and *costs of environmental measures*. These categories are not designed to provide any direct quantification but they usefully separate into two main streams the economic effects of the measures under evaluation.

1. Environmental damage costs

In the analysis of environmental costs it is useful to differentiate between two types of costs: *direct costs* and *indirect costs*. This is because of the need to separate the costs of specific negative effects, acting directly on some environmental function from the costs resulting from indirect damage caused by these effects on other functions.

a) *Direct costs of environmental damage*

These costs relate to the damage caused by negative agents which affect some environmental function: pollutants or waste products, overexploitation of natural resources or squandering of energy, marginal settlements, noise, etc., with reference to specific environmental functions.

b) *Indirect costs of environmental damage*

These costs arise because negative agents can cause other damage to the environment resulting in additional expenditure to prevent greater damage: the pollution of rivers makes them unfit for recreation, overexploitation of

forests causes erosion and desertification, lack of urban planning turns cities into eyesores and depresses their inhabitants.

This category of costs generates the first category of benefits: *cost reduction of environmental damage*. Thus, environmental benefits can be basically seen in terms of a reduction of damage or threat to the environment by past, present and future economic activities. This is valid for CBA application to all types of environmental measure. Investment projects are a different matter, for they have or could have important effects on environmental functions. In these cases the evaluation process should seek ways to introduce potential future costs into the cost categories used in the project's evaluation, as well as the environmental benefits which could derive from the projects.

2. Costs of protection measures

As was indicated earlier, there are costs associated with the study, implementation and maintenance of environmental measures which constitute a valuation of all the social resources allocated to the implementation of a protection measure. Thus, they can be likened to a public investment. Various categories have been proposed for taking these CBA costs into account. It should be made clear that these costs do not generate any kind of counterbalancing benefit in the way that environmental damage costs do. These costs could be classified in general terms as follows (Lingren and Olsson, 1978; Facht and Opschoor, 1978):

a) *Costs linked to the reduction or elimination of damage*

i) *Regulation and monitoring costs*: These costs arise from activities that determine *which capacities* of the environment should be used and in *what quantities* their use should be permitted (regulation costs). There are also costs which arise from monitoring the implementation of measures (monitoring costs). These costs do not necessarily imply a regulatory activity as such but rather general rules or standards regarding the use of environmental capacities. Accordingly, regulation can mean not only the establishment of emission level limits but also specific policies to protect material and energy resources or develop a place for social recreation. Monitoring activities appear essential for adequate management and implementation of environmental policy.

ii) *Financial costs*: These costs are basically opportunity costs of the alternative uses of resources allocated to measures. They are predominantly financial and do not relate to specific outcomes of the measures concerned.

iii) *Research and information costs*: These costs relate to research, teaching and information activities designed to improve social understanding of the importance, needs and effects of environmental changes. They could also be determined for those types of measures which do not arise from

environmental deterioration but rather correspond to a social goal of environmental quality.

It should be pointed out that the three types of costs indicated above originate basically at the highest levels of the country's structural organization, i.e., the national, regional or local authorities. In other words, they are the responsibility of the government and other agencies of the country's administration (ministries, regional governments, municipalities, etc.). No costs of this type will normally be imputable directly to individuals.

b) *Costs of increasing environmental capacities*

i) *Restoration costs*: These are the costs of restoring the quality of a damaged environment. They are generally linked to reclamation activities, in which they will constitute an important component in the cost structure. However, both protection measures and environmental improvement measures may involve an element of restoration, apart from the fact that in many cases distinguishing between one or the other type of measure is more a matter of theory, since many measures form part of a more comprehensive environmental policy in conjunction with other types of measure.

ii) *Costs of creating new environmental capacities*: These are the costs of creating new environmental goods and services, needed for policy implementation: creation of a national park, designation of a traffic-free zone, designation of a region as a desert, etc.

iii) *Conservation costs*: These are the costs of conservation of specific areas. They are associated with the preceding types of costs but they relate more to the actual activity of developing and operating such areas.

This second set of costs, unlike the first set are direct costs for both governments and individuals; the latter must adapt their activities to the environmental standards set by government. The presence of one such type of costs within the cost structure will depend on the kind of environmental measure in question. For example, the types of costs described in b) i) and ii) do not usually arise in protection measures but are typical of environmental restoration and improvement measures.

The costs of environmental measures presented thus far are generated concretely in production activities in the form of normal cost items, i.e.:

– *Implementation costs*: These are the costs associated with the installation of equipment or processes for monitoring and modification of activities altering the environment. They may be regarded as costs associated with investment in machinery and/or equipment for implementation of the measure. They may be of two types:

– *Additional installation costs:* Costs of equipment used in the direct treatment of waste products prior to dumping, in order to render them less harmful to the environment;

– *Costs of new processes*: Costs associated with changes in productivity and/or product quality, owing to the development of processes which cause less damage.

– *Capital costs*: These consist of financial charges calculated as the opportunity costs of the capital used for environmental control purposes.

– *Operating and maintenance costs*: These costs include expenditures on the manpower, materials and energy required for the efficient operation of environmental control equipment.

All the items indicated above are expenditures which each unit producing emissions or each user of scarce resources must effect in order to meet the requirements of the protection measures.

3. Social costs

These costs are the reductions in welfare due to the damage caused to the environment. Like environmental damage costs, they are generally regarded as benefits. They correspond to the social benefit of the increased welfare resulting from the protection, restoration or improvement of the environment. In this case too, it is necessary to distinguish between environmental measures and projects with environmental consequences. In the former, social costs are benefits, except for those costs directly associated with loss of welfare due to the allocation of social resources to environmental protection. In the latter, social costs are the costs as such, arising during the project's life time, including the disposal of installations, for example, once operations in an industrial plant have ended.

4. Benefits of environmental protection measures

In the context of the cost categories indicated above, the objective of protection measures is to prevent damage to the environment. This produces the first set of benefits. Breaking environmental damage costs down into direct and indirect costs, measures for reducing direct damage should be designed to reduce or eliminate both the possible damage and the possible costs caused by other damage. In the same way, so-called environmental costs imply that measures should be implemented in an attempt to reduce the costs arising from the process. All this means that the benefits of measures could be assessed in terms of the achievements in respect of environmental quality, plus the reduction in the cost of the achievements.

As stated earlier, benefits from environmental measures may be defined as reduction of the costs of environmental damage, plus the social welfare improvements resulting from the measures. Both types of costs –environmental damage and social welfare– may be calculated or estimated in monetary terms. Therefore, monetary benefits can be assessed as the

corresponding reduction in monetary costs. On this basis we can identify two kinds of result:

– *Financial losses*: These are the monetary values of the changes in the market demand for goods and services due to changes in environmental quality.

– *Loss in environmental value*: These are the monetary values of environmental changes which are not directly exhibited as changes in market behaviour.

The two categories constitute one of the best ways of dealing with the problem of the monetary valuation of environmental benefits. It is clear, in any case, that these are indirect ways of calculating damage costs, which are practically impossible to measure directly, since there is no comprehensive price system which would represent the relative scarcity of environmental goods, services and resources. In other words, the lack of a market for them prevents a complete estimate. A direct calculation should be attempted in cases in which some effort has been made to internalize the environmental changes and for which more or less reliable prices, or pseudo-prices, exist.

Monetary valuations of social costs, understood as welfare improvements, should be interpreted as social benefits, by determining and calculating the welfare functions.

Both long-term and short-term effects should be considered in the calculation and estimation of all these benefits and costs. A definition of the time-frame is essential in this process, since many benefits will emerge only in the long term. Use of a short time-frame will necessarily mean that a large number of possible benefits will not be taken into account. Some specific characteristics of environmental systems, such as synergism or emission concentration levels, could produce negative values in the short-term economic assessment. The result would be that the measure would imply a cost to the present population and a benefit to future generations. It is necessary to emphasize the urgent need for greater accuracy in establishing evaluation time-frames. As has been indicated, the results could be radically altered by time factors. In this respect the quantification process must be reinforced by some kind of analysis of the system. Another very relevant factor which should be considered is the stochastic nature of many environmental variables and parameters. This makes it very difficult to know exactly what the true designed effects are. Thus, it is clear that uncertainty and risk analyses need to be made for the main variables and parameters and for evaluation results. Although it has been stated repeatedly, we must emphasize the fact that the estimation and calculation of benefits is far from a direct and clear process. Supplementary analytical techniques must be used to back up the evaluation, techniques which are not always required for the evaluation of other types of project.

Benefits should be evaluated in monetary terms as far as possible. This will depend, on the one hand, on familiarity with quantification techniques

and, on the other, on the availability of sufficient and reliable data for building benefit functions. Both limitations may in many cases be impossible to overcome. Some benefits of environmental measures have been classified as *intangible* or *non-measurable*. Although they are true benefits, in the sense that they increase social welfare and the quality of life, it is very difficult or even impossible to calculate the corresponding values. Some work has been done on the improvement of quantification techniques, but it must be remembered that in many cases completely valid results have not been obtained.

The problem of lack of data, increases the uncertainties of the analysis and of course points to the need to create an information system to support decision-making. The experience of the last few years in environmental protection activities has shown that, in reality, it has been possible to do very little, especially as we have been working with a very low level of understanding of environmental issues.

BIBLIOGRAPHY

Ahmad, Y. J. and J. Leal (1980): *Cost-Benefit Analysis for Environmental Management*, Monaco, Petromar.

Ayres, R. V. and A. V. Kneese (1969): "Production, consumption and externalities", *American Economic Review*, June.

Coomber, N. H. and A. K. Biswas (1973): *Evaluation of Environmental Intangibles*, Genera Press.

Tacht J. and H. Opschoor (1978): *The Role of Benefit Evaluation in Environmental Analysis*, United Nations Environment Programme (UNEP).

ICC (International Chamber of Commerce) (1980): *Cost-Benefit Analysis of Environmental Protection Measures*, Paris.

Kneese, A. V. (1977): *Economics and the Environment: A Material Balance Approach*, Resources for the Future, London, Penguin Books.

Leal, J. (1985a): "Evaluación económica de proyectos y funciones del medio ambiente", Latin American and Caribbean Institute of Economic and Social Planning (ILPES), Training Programme, Lecture notes (CDA-41), Santiago, Chile.

Leal, J. (1985b): "Conceptos básicos de economía del medio ambiente", *ibid.* (CDA-30, revised version).

Lingren, K. and J. Olsson (1978): *The Macroeconomics of Environmental Protection*, Ministry of Environment, Stockholm.

Pearce, A. W. (1976): *Environmental Economics*, London, Longmans.

Seneca, J. J. and M. K. Taussig (1974): *Environmental Economics*, Englewood Cliffs, New Jersey, Prentice Hall.

Sunkel, O. and N. Gligo (eds.) (1980): *Estilos de desarrollo y medio ambiente en América Latina*, Mexico City, Fondo de Cultura Económica, Lecturas series, No. 36.

Sunkel, O. and J. Leal (1985): "Economics and environment in a developmental perspective", *International Social Science Journal*, No. 109, vol. XXXVIII, No. 3, UNESCO, Paris.

Torres, S. A. and A. W. Pearce (1979): "Welfare economics and environmental problems", *International Journal of Environmental Studies*, vol. 13, London.

Victor, Peter A. (1972): *Pollution: Economy and Environment*, University of Toronto Press, Toronto, Canada.

UNEP (United Nations Environment Programme) (1979a): *First Progress Report on Classification and Categorization of Available Case Studies on Cost-Benefit Analysis* (UNEP/IG.15/3/Add.1.), Nairobi.

____ (1979b): *Second Progress Report on the Evaluation of Available Case Studies on Cost-Benefit Analysis* (UNEP/IG.17/5), Paris.

____ (1979c): *A Background Note on Cost-Benefit Evaluation of Environmental Protection Measures* (UNEP/IG.15/2), Nairobi.

____ (1979d): *A Framework for the Design of Future Case Studies on the Application of Cost-Benefit Analysis to Environmental Protection Measures* (UNEP/IG.17/7), Paris.

____ (1980a): *Review of Environmental Cost-Benefit Analysis Case Studies. A Report* (UNEP/IG.21/5), Istambul.

____ (1980b): *A Framework for the Application of Cost-Benefit Analysis to Environmental Protection Measures* (UNEP/IG.21/2), Paris.

III

INVENTORY AND EVALUATION OF NATURAL RESOURCES FOR REGIONAL AGRICULTURAL PLANNING

by Oscar René Saa Vidal*

SUMMARY

This paper describes the incorporation of the topic of natural resources in regional agricultural planning, distinguishing between the inventory and the evaluation of natural resources. It emphasizes the role of integrated studies of renewable natural resources as a way of incorporating the environmental variable in regional planning, specifying the content of the studies, the integration of one variable with another and their usefulness for planning.

It then gives a brief account of some of the methodologies used in making an integrated survey of natural resources, based on experience in several countries.

Finally, the paper refers to Colombia where the evaluation of natural resources is carried out at the regional level (departments), analysing the Agricultural Regionalization Programme of the Colombian Ministry of Agriculture with the participation of the Departmental Governments and the technical assistance of FAO.

The conclusions of the paper aim to emphasize the unity in the geographical environment between man and the physical elements and the way in which man changes this by reason of his technical and economic development and his moral values. It points out that it is the task of students of natural resources to examine the interrelationships between man and his geographical environment which cause alteration or deterioration in nature, and the task of natural resource scientists to seek ways of controlling or improving these relationships for the sake of a more harmonious world. Lastly, the paper indicates the role natural resource specialists should play in

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interdisciplinary planning teams in order to incorporate, in the best possible way, the natural resource dimension in regional development plans, programmes and projects.

A. BACKGROUND

The incorporation of the topic of renewable natural resources and conservation of the environment in regional agricultural planning is new. It is based on the principle that, in the first place, it is necessary for planners to be provided with a quantitative base for the area studied, mapped where possible, and this necessarily implies incorporating the environmental dimension of the physical and social phenomena of the geographical environment where the action is to be taken.

On the basis of a holistic conception of the geographical environment and a physical and sociocultural unity, in studying and identifying the main obstacles to the most suitable use of resources the geographical method leads to a systematic understanding of the interrelationships between the physical and the socioeconomic world. Geographical unity resides in the unity of the subject of the study: the geographical environment (geosystem, geoecosystem, landscape) which reflects the unity and interrelationships of the physical and human components of the geographical situation. It seeks a dynamic understanding of the interwoven fabric of the physical and socioeconomic world in a specific place. This provides an appreciation of the term "geographical space", and encourages the depiction of the physical and socioeconomic phenomena on maps with a view to detailed quantification of each individual phenomenon, contributing thereby to the whole planning process: without adequate maps, we cannot plan space.

In this paper the global concept is presented in the form of an integrated evaluation of natural resources; the evaluation method is explained below.

B. THE INVENTORY AND EVALUATION OF RENEWABLE NATURAL RESOURCES IN THE PLANNING CONTEXT

1. Definition

The elements of the geographical environment are natural resources if a society develops specific ways of perceiving them and valuing their use. In other words, a natural element is a resource when it is usable by man. Therefore, natural resources are not stable in time and temporal stability depends on the technological development of the society, its beliefs and its ethics, conditions which play an important role in the perception process either to preserve or to degrade natural resources and, in the end, the environment.

Given this, what is a natural resource for some societies may not be one for others; atomic energy, based on radioactive minerals, and petroleum have changed over this century from simple natural elements into important natural resources, as technical and economic development have facilitated their use.

Most experts classify natural resources into two large categories, renewable and non-renewable. The first includes land, water, natural vegetation, wildlife, etc., and the second includes metallic and non-metallic mineral deposits.

The term "renewable natural resources", is relative, since their replacement depends on natural and economic factors. The return of a resource to its original state so that it can be used again by man can take several generations. For example, for the land in the temperate zone to return to its natural state would take 500 to 1 000 years. In other regions of low temperature and rainfall the decomposition of rocks and minerals can take much longer. The natural vegetation in the tropical rain forest, destroyed by shifting cultivation, would need 50 to 100 years to return to its original state, if it can. In both examples the resources are renewable within a human time-scale. Sometimes it happens that resources traditionally thought renewable are not entirely so. For example, soils composed of volcanic ash, very common in areas of intense past volcanic activity, such as the Andean countries and several Central American countries, are now, with the intervention of man and the elimination of the natural vegetation, suffering severe erosion with no real possibility of recovery within the human time-scale.

The above is intended to show, first, the relativity of the renewability or non-renewability of a natural resource and, second, the variations over time of the category of resource, which depends on technical, economic and cultural development, and finally the importance of conservation in the study and economic use of natural resources.

2. Inventory and integrated evaluation of renewable natural resources

The inventory of the natural resources of a country or region always refers, as its name indicates, to a quantification, global or by politico-administrative or natural divisions, of the amount of available resources, without qualifying their different alternative uses. On the other hand, the evaluation of natural resources is a more complex stage and is designed to classify the resources for different uses, taking into account social and economic considerations and possible interrelationships of one resource with another. Both approaches are useful for planning, but an evaluation of natural resources is much more advantageous for planners than a simple inventory.

An example will better clarify this differentiation. An inventory of the land of a country or region quantifies the total amount of land available for agriculture, livestock or forestry or as protected areas. On the other hand, an evaluation of the land of a country or region quantifies and analyses it for different alternative uses such as use for cultivating corn, beans, or fruit, or as natural or artificial pastures, for reforestation, etc.; this makes it necessary to analyse other resources (such as climate, water, etc.) and make socioeconomic studies (markets, infrastructure, resource ownership, etc.).

The integrated evaluation of resources leads to closer communication between the natural resource scientist and the planner.

There has existed since the 1960s a series of methodological approaches to integrated research on renewable natural resources which can be summed up in two forms of integration, one called "horizontal integration" and the other "vertical integration".

In horizontal integration the resources are studied by bringing together a group of specialists in different areas not only to study the aspects specific to their subject but also to become thoroughly informed in the other disciplines and integrated with the other specialists. This type of integration assumes that the work team is in communication at all stages of the research. It is difficult, but not impossible. It is only achieved if the team of specialists manages to overcome the specialization barrier.

Vertical integration consists of the work of one or two technicians with a general knowledge of earth sciences (geographers) who are capable of synthesizing and identifying the most important resources of a region or country.

Both approaches are valid; in horizontal integration, because it involves specialists, the information obtained is more exact and much more useful for detailed and semi-detailed integrated resource studies for regional planning or specific projects, while vertical integration is extremely useful for general reconnaissance.

a) *Content of integrated studies of renewable natural resources*

Integrated research on renewable natural resources is a complicated task and requires a high degree of communication among the specialists and between them and the planners. However, it is the best way to incorporate the "resource" variable in economic and social planning, and the results of the surveys make it possible to consider alternatives for optimizing the use of the resources: water (surface or ground water), land (soils and geology), natural vegetation, wildlife, etc.

Such an approach consists in studying each of the natural resources of a country or region, analysing the interrelationships (at least the more relevant ones) between one resource and another, and drawing conclusions about the use of the resources as a whole, so that the optimized and intensive use of one

does not cause deterioration in others; in other words, to achieve the most harmonious development of all the environment's elements.

The natural structure is studied through its components (climate, land, water, vegetation, etc.), which are analysed separately and then integrated to achieve a comprehensive interrelationship.

The relationships of man with nature is manifested through the use he makes of nature. These relationships are described in synthetic documents. One is potential use of the resources and the other is actual use. A comparison of them facilitates the implementation of policy changes with respect to national or regional development plans and programmes. Therefore, integrated studies of renewable natural resources should provide information about at least the following:

- present resource use;
- potential resource use;
- recommended resource use;
- the manpower required by the recommended use;
- the relationship between the recommended use and the size of the forms (other relationship parameters could be used, such as the road network, proximity to population centres, domestic and foreign markets, etc.);
- comparative analysis of present and recommended use.

In this process, an effort should be made not only to achieve more integrated knowledge of the natural resources themselves but also of the use man makes of them, using a series of criteria which could be called "determinants of use", such as the size of farms, resource ownership and communications infrastructure, to name only a few.

As an example, figure 1 summarizes the content of a study on renewable natural resources for agricultural development, distinguishing between research tasks and planning tasks.

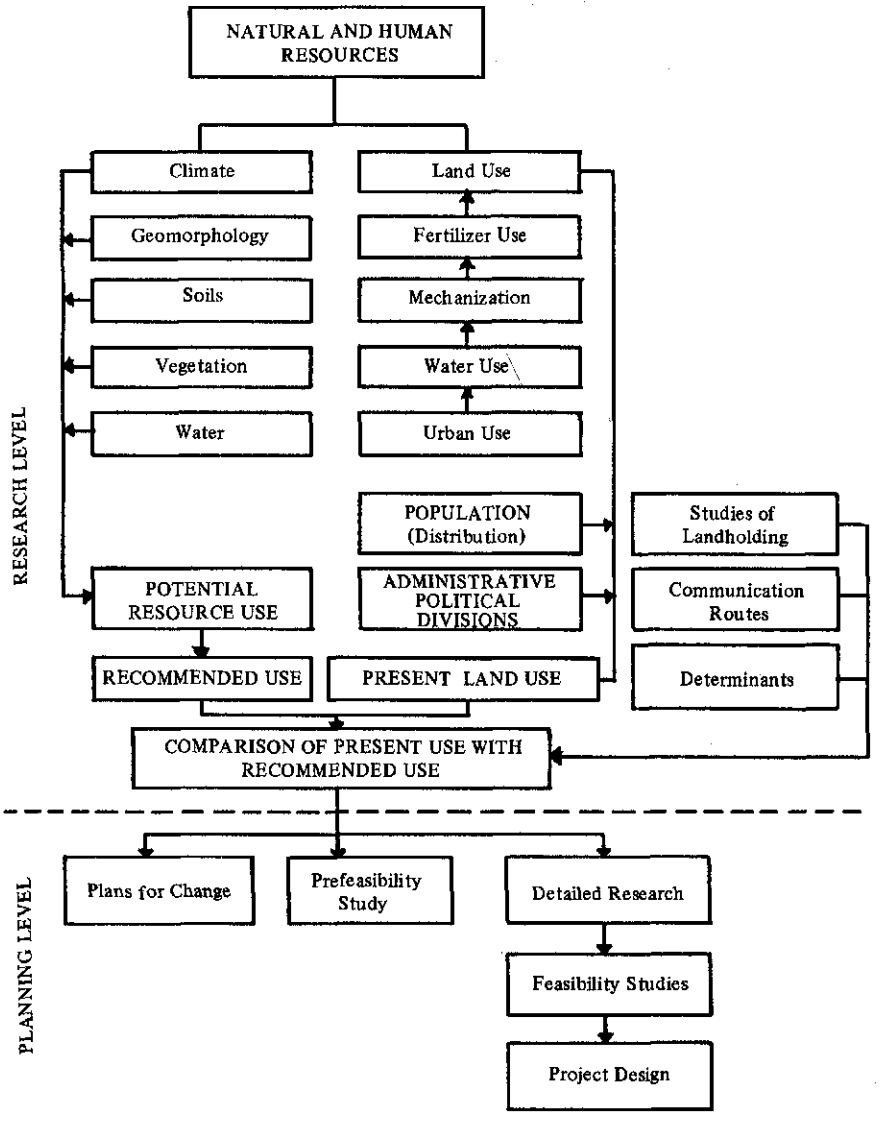
3. Renewable natural resources and planning

The incorporation of the "natural resource" variable in its spatial and quantified dimension is a relatively new addition to planning procedure. When moving from national planning to more specific sectoral, regional or local planning, the need becomes more obvious for natural environment data, quantified and located in space, particularly on the potential of available natural resources, their present use and the various natural, social or economic obstacles to their more rational or intensive use.

Research on renewable natural resources has been carried out by a very wide range of scientists in the fields of agronomy, forestry, climatology, pedology, geology, oceanography, etc., to name a few. This research, of various degrees of detail is carried out in the style of specific disciplines or answers the specific needs of sectoral agencies for developing a specific resource. The one-sided nature of the studies is a reason for the current lack

Figure 1

CONTENT OF AN INTEGRATED EVALUATION OF NATURAL RESOURCES FOR PLANNING



of an overall or integrated view of the natural resources available in a country or region. Cases can be found where a country will have detailed soil studies for some local areas, but no appraisal of the total area in the country suitable for agriculture or of land which could be irrigated or included in conservation programmes, etc.; nor are their present use or ownership indicated. The reverse can happen, when global quantified information on a resource is available, but lacks detail and the specific data necessary for supporting given development projects. The extreme case is also quite common, where priority areas or regions for the central planning agency have provided no data on natural resources.

This shows that there is some disjunction between planning and natural resource research. Therefore, in order to overcome this problem, it is necessary to institute dialogues between planners and natural resource researchers, fixing beforehand the priorities and the detail of the data on a set of natural resources needed by planning in order to promote economic development in a specific area. This step should be taken in good time, since the natural resource inventory and evaluation takes time and sometimes years of observation, as in the case of water and climate where observation stations must be operated for at least 10 years in order to collect representative data.

The results of a natural resource study, no matter how detailed, are usually presented in the form of maps. Therefore, it is urgently necessary to prepare basic maps of a country or region, preferably topographical maps on different scales, to show the spatial distribution of the resources. The scale of the maps determines the level of detail they contain, and it is therefore possible to draw a parallel between the scale of the maps in natural resource studies and the level of planning, as shown in table 1. The use of computers has improved the preparation and rapid use of these tools.

4. Methodologies used in integrated surveys of renewable natural resources*

The several methodologies developed in the integrated study of natural resources are described below:

a) *Land system*

Christian and Stewart (1968) of the CSIRO, Australia, developed a system of vertical integration in natural resource surveys. The objective was to define for a large area, on which little information was available, different types of "landscapes" requiring different degrees of effort for their development. Generally, joint studies are made of: land forms (geomorphology), soils, vegetation, lithology (geology), and climate. To this information are added

* This description does not claim to be exhaustive.

data on hydrology, land management, agriculture, and land use in general. The team should consist of at least, a geomorphologist, a pedologist, and a phytoecologist who, working together and with the help of aerial photographs or satellite images, arrive at a definition of the various "land systems".

Table 1

RELATIONSHIP BETWEEN SURVEY AND PLANNING LEVEL

Survey scale *	Planning level
1. Reconnaissance or exploratory Scale 1:500 000 to 1:1 000 000 or more	National (Global) Planning Basic information for defining the main objectives of national development
2. Semi-detailed Scale 1:50 000 to 1:250 000	Regional or sectoral planning Information for regional development and project identification
3. Detailed Scale 1:20 000 to 1:5 000 or less	Local planning or project design Detailed information for development projects at the pre-feasibility and feasibility levels

*The scale categories are only indicative and could vary from country to country.

This type of survey is useful in the spatial conditions of Australia and, perhaps, in other parts of the world where the physical environment has not been profoundly changed by human activity. The "land system" method is suitable for reconnaissance studies since it eliminates unnecessary detail and it is very useful for evaluating the natural resources of extensive areas for settlement purposes and for generating basic information for global planning. The disadvantage is that the integration is based exclusively on physical factors, without taking socioeconomic factors into account. This is because it was originally used in practically uninhabited territories.

Approaches similar to the "land system" were later developed by MacPhail (1971) in Chile and Nunnaly (1969) in Ashville, United States.

b) *Superimposition of maps*

This approach to integrated natural resource surveys consists in making a series of maps with the help of aerial photographs or satellite images on a uniform scale (soils, vegetation, population, farms, etc.) which are integrated by superimposing the maps so as to identify areas with different degrees of potential for different uses. This method, first used by Drewes and his colleagues (OAS, 1964), was employed in the natural resource survey and the identification of development areas in the Guayas River basin in Ecuador and in other OAS studies (1970, 1972) in the Dominican Republic and Haiti. The writer (Saa Vidal *et al.*, 1967, 1968) used this methodology for the inventory of natural resources in the extreme south of Chile (Aysén and Magallanes provinces).

The superimposition of maps showing different data has some difficulties: one is that when more than three maps are superimposed it is difficult to integrate the variables; and the other is the intrusion of subjective factors.

To lessen this difficulty, geographers of the Chilean Natural Resources Research Institute (IREN) developed a system of "computer mapping" (IREN, Cautín, 1970) which consists in studying a range of natural and human resources on specific scales. Each of the resources studied is then decoded according to some scheme. Soils can be decoded into generative material, depth, drainage, series, etc.; geology into formations, rock type; geomorphology into fluvial, lacustral, glacial deposits, etc.; vegetation into natural pasture, scrub, forests, etc. Each map decoded by resource is then transferred to a matrix divided into $1cm^2$ squares (625 hectares on a scale of 1:250 000). This procedure is followed for each resource. Finally, once all the main elements of each resource have been codified, the matrix is used for establishing the limits of homogeneous units, called equipotential landscapes. A similar procedure is followed for the elements representing man's use of the resources.

An inconvenience of this methodology is that the equipotential landscapes lose their natural boundaries, and this disorients the majority of users, who are usually not accustomed to reading abstract maps. To avoid this difficulty, a variation of the method uses soil as the integrator of the other resources, making it possible to identify equipotential landscapes with their natural boundaries (IREN, 1973).

c) *Dynamic geomorphology method*

This method, developed by Tricart (1970), looks for the interdependency of natural phenomena in dynamic geomorphological processes. It identifies the limiting factors of an area for various development alternatives and delimits areas with some degree of homogeneity.

d) *Phytoecological method*

This method was developed by the Centre for Phytosociological and Ecological Studies, of Montpellier, France, and uses phytological maps as the basis for land-use planning. Vegetation studies are used to incorporate other disciplines such as climatology, pedology, geography, etc., in an attempt to acquire precise knowledge of the natural ecosystem. These studies of the physico-natural environment are complemented with agricultural and economic studies. The result is a proposal of alternative natural resource uses which guarantee a balanced environment.

e) *Method of life forms or zones*

This method was developed by Holdbridge (1967) and has been widely accepted in the mountainous Latin American countries with tropical climates. It consists in studying annual temperature and rainfall. For temperature it introduces the term biotemperature[1] as the measure of effective heat for plant growth, regarding very low temperatures as limiting factors. Using biotemperatures of 0°, 3°, 6°, 12°, 24°C, the world is divided into latitudinal zones: polar, subpolar, boreal, cold temperate, low subtropical temperate, subtropical, and tropical. Just as there is a differentiation in temperatures because of latitude, there also exists, according to Holdridge, a differentiation by altitude and he distinguishes various altitude levels: alpine, subalpine, mountain, and low mountain foothill. The temperature boundaries between levels are logarithmic.

For each altitude level there is an equivalent climate, a zonal soil and standard atmospheric conditions. Azonal soils relate to non-standard climatic conditions: excessive winds, rainy season or abnormally distributed rainfall (monsoon), etc.

Finally, Holdridge introduces the concept of evapotranspiration potential.[2]

Almost all the Latin American intertropical countries have experimented with this method and have reconnaissance scale maps of the General Life Zones. Generally, for each life zone a description is given of the natural vegetation and climatic ranges: temperature and rainfall; and agricultural, livestock, forestry and conservation uses are proposed which are suited to the natural conditions. The use of these maps is very helpful in evaluating a country's renewable natural resources.

Since a map of life zones requires climatic data, more detailed analysis of regions or smaller areas is hampered by the lack of climatological stations.

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[1] Biotemperatures are calculated summing the average monthly temperatures above zero degrees centigrade and dividing by 12.

[2] Evapotranspirational potential is obtained by multiplying the biotemperatures by a constant, divided by annual precipitation in mm.

The methods explained above are only a few examples among many, tried out or in operation in different countries. The National Office for Evaluation Natural Resource (ONERN) in Peru (Lizárraga *et al.*, 1969) carries out natural resource studies according to the requirements of the National Planning Institute. The International Institute for Aerial Survey and Earth Sciences (ITC-UNESCO) in the Netherlands offers post-graduate training in techniques for natural resource evaluation and inventory, with an integrated approach directly related to planning, especially regional planning. The same is done by the Inter-American Centre for Photo-Interpretation (CIAF), in Bogotá, Colombia.

Several countries are creating institutes specializing in natural resource data for planning, using intensive aerial photography and remote-sensing techniques. Ecuador created the Centre for Integrated Surveys of Natural Resources by Remote Sensing (CLISER). In Brazil, the natural resources of the Amazon basin are studied by the Institute for Special Studies and specifically by the RADAM project which uses radar images, LANDSAT satellite images and aerial photography. Also in Colombia radar images and infrared aerial photography are used for studying natural resources in the Amazon basin (Molina, 1974) as well as in soil and land surveys carried out by the Agustín Codazzi Geographical Institute (IGAC) and in studies of present land use carried out by the Ministry of Agriculture and the Regional Units of Agricultural Planning (URPA) of each department.

C. EVALUATION OF RENEWABLE NATURAL RESOURCES: REGIONAL AGRICULTURAL PLANNING

In Colombia, the Ministry of Agriculture, with the technical assistance of the Food and Agriculture Organization of the United Nations (FAO) and the financial support of the National Government and the United Nations Development Programme (UNDP), has been creating in all departments of the country Regional Units for Agricultural Planning, known as URPAs.

The departmental URPAs are part of an effort by the National Government the Departments to create sectoral technical and information bases to provide a better knowledge of local situations, so that the local authorities can, as far as possible, technically implement their decisions. There are now 24 URPAs in the country at different stages of institutional and technical development. Each URPA in the interior is organized according to the attached organizational diagram (see figure 2).

Since agricultural planning is interdisciplinary, each URPA planning team has a group of professionals who study renewable natural resources and their relationships through the generation of statistical data, provide the mapping basis and incorporate the concept of renewable natural resources in the

Figure 2

FUNCTIONAL ORGANIZATION OF THE PROJECT AT THE DEPARTMENTAL LEVEL

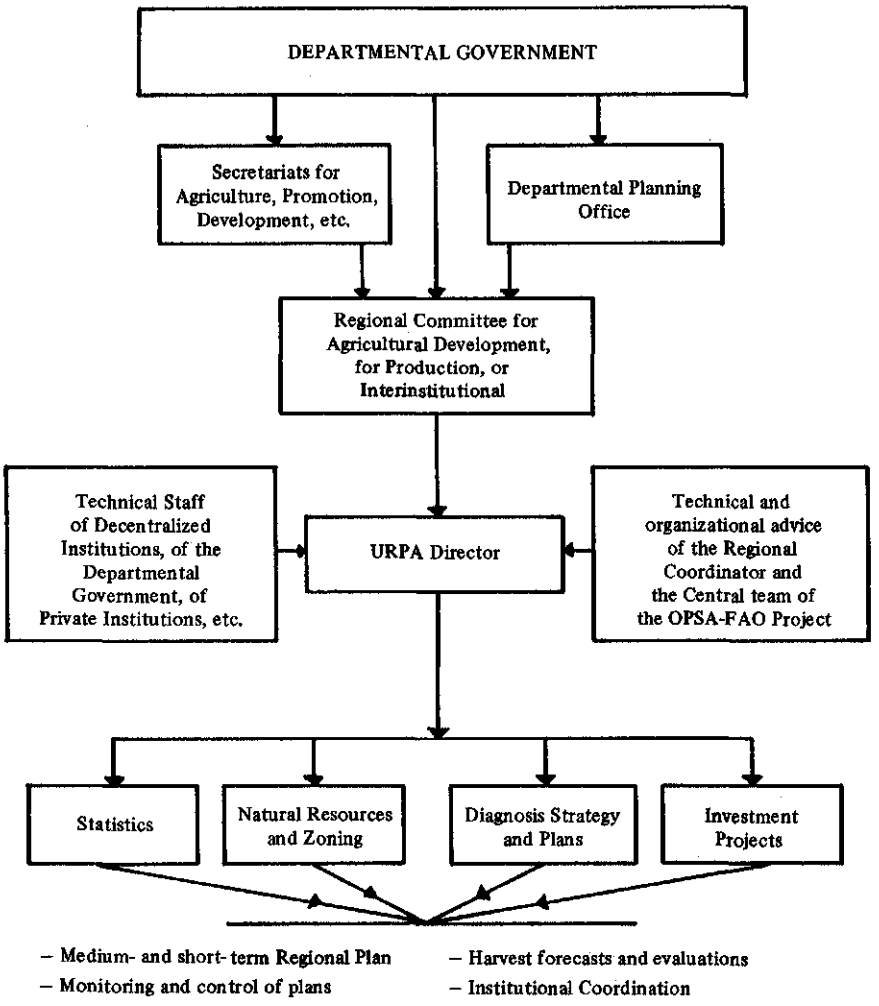
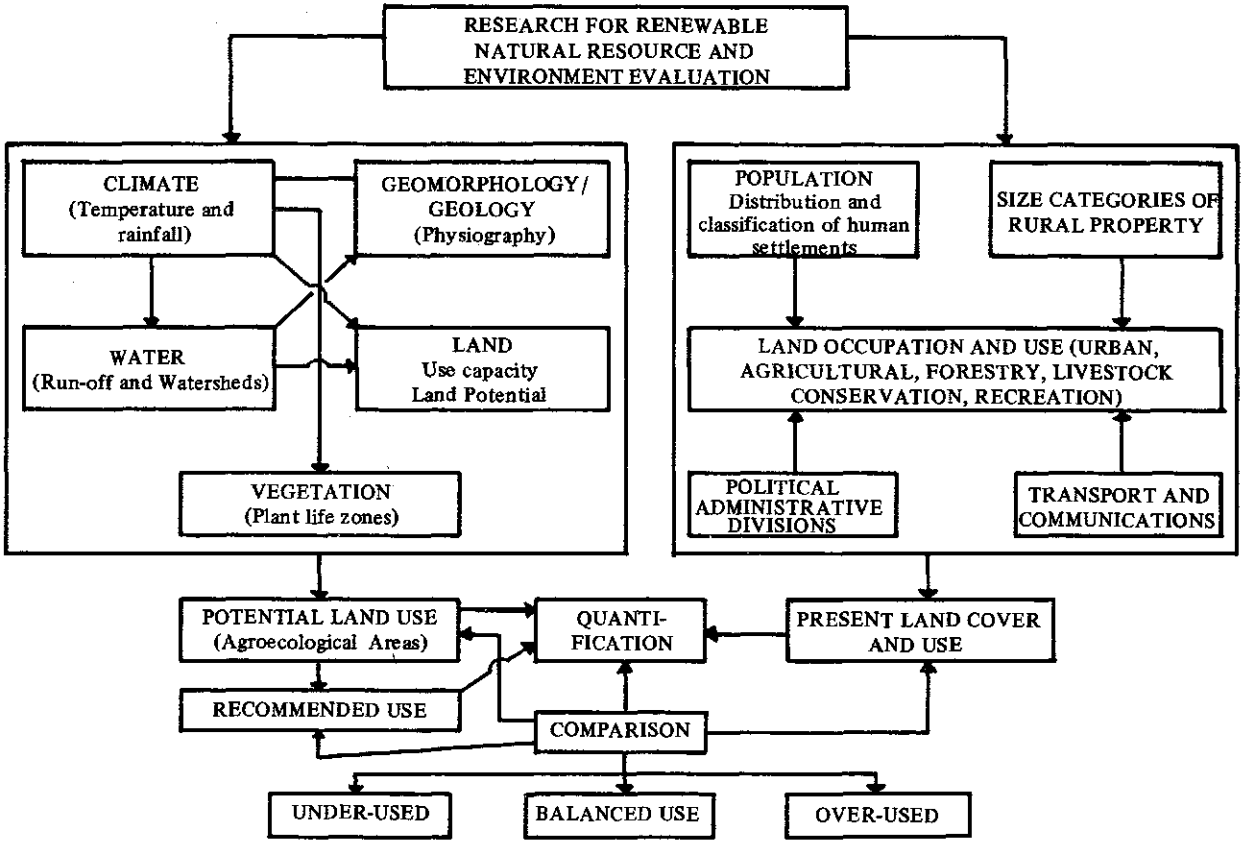


Figure 3


RESEARCH FOR RENEWABLE NATURAL RESOURCE AND ENVIRONMENT EVALUATION
CLIMATE (Temperature and rainfall)
GEOMORPHOLOGY/ GEOLOGY (Physiography)
WATER (Run-off and Watersheds)
LAND Use capacity Land Potential
VEGETATION (Plant life zones)
POPULATION Distribution and classification of human settlements
SIZE CATEGORIES OF RURAL PROPERTY
LAND OCCUPATION AND USE (URBAN, AGRICULTURAL, FORESTRY, LIVESTOCK CONSERVATION, RECREATION)
POLITICAL ADMINISTRATIVE DIVISIONS
TRANSPORT AND COMMUNICATIONS
POTENTIAL LAND USE (Agroecological Areas)
QUANTI-FICATION
PRESENT LAND COVER AND USE
RECOMMENDED USE
COMPARISON
UNDER-USED
BALANCED USE
OVER-USED

agricultural development plan and its projects at the diagnosis, design policy and strategy stages.

The theory underlying the design of the different phases of the treatment of natural resources in an agricultural planning scheme is shown in figure 3.

In studying a specific geographical region (in this case a department) the idea is to determine the "abiotic potential" grouping the abiotic elements, such as the geomorphological, climatic, hydrological and geological aspects directly related to man; studies are made of the "biotic potential", which includes all the vegetable and animal communities, and of the related "anthropic use". There is also an attempt to understand the impression made by a specific social group in its relationship as a society with the environment. For the purposes of agricultural planning the spatial study of ownership (and/or holding) of the land is particularly important, as are the communications patterns of the population (dispersed or concentrated settlements) and the political administrative division.

It is understood that in a geographical landscape there is a very close relationship between abiotic and biotic elements and human action. The normal interactions of the abiotic elements with the biotic are altered by man, wittingly or unwittingly, for the sake of energy and natural flows. The purpose of an analysis and evaluation of the natural resources of a geographical area is to study these alterations or disturbances and seek suitable correctives, and to try to understand the main causes of this imbalance and apply, through planning, measures to harmonize man with his natural environment.

The scheme proposed in Colombia, not yet complete, is essentially an attempt to provide planners with materials to determine the forestry and agricultural potential of a region, indicating the extent and present use of the available natural resources on maps and providing statistical data at the political administrative level. The scheme also provides additional explanatory material about the spatial distribution of land ownership or holding, the spatial distribution of the population, and communication patterns.

The potential use of the resources, generally studied and analysed from a conservationist standpoint and illustrated on comparative maps facilitates the separation and spatial identification of areas of the study region which are well-used, over-used and under-used. This information is, in our view, the starting point of any policy for renewable natural resources conservation. Given knowledge of the situation, quantified and spatially located, comparisons can then be made with maps or studies of the socioeconomic component to explain the reasons for the balanced use, over-use or under-use. On the basis of these considerations, planners plan changes according to the goals established, making project feasibility studies and programming them from the stage of detailed research to project design.

At present each URPA in Colombia follows this model for all natural resource studies. For these studies the base scale ranges from 1:50 000 to

200 000, depending on the size of the area being studied. Usually the surveys are shown on a scale of 1:100 000. They start by collecting and analysing all existing data on soils, climate, vegetation, geology/geomorphology, and information about the extent and type of present land use and property size. To sum up: for each department the intention is to compile secondary or direct information on the following maps:

1. Interpretative Map of Soils in Agricultural Classes and Subclasses, incorporating geomorphological/geological and climatic information.
2. Map of the Cover and Present Use of the Land, usually made on the basis of information collected directly in the field and with the help of aerial photograph and satellite image interpretation.
3. Map of Rural Property Distribution by Size, made on the basis of information available from the country's Geographical Institute.
4. Map of Railways and Political Administrative Divisions.
5. Map of Rural and Urban Population Distribution, on the basis of census information and other sources.
6. Comparative Map of Present versus Potential Land Use (Agricultural Classes and Subclasses), showing the areas of balanced use, over-use and under-use.

D. CONCLUSIONS

1. The proposed methodology maintains the existing unity in the geographical environment between natural elements and man, with the exception of natural ecosystems, untouched by man, of which there are now few in this world.
2. It is necessary to incorporate in regional and rural agricultural planning a quantified and spatially located analysis of natural resources, integrated and dynamic in all phases of planning.
3. The incorporation of the topic of natural resources implies their conservation and it is the job of natural resource specialists to recognize the transforming effects of human action on the natural environment and to search for suitable corrective measures in the light of the social and economic conditions of the area under study.
4. Natural resource scientists should join interdisciplinary planning teams so that, through mutual understanding, they can incorporate in the decision-making process considerations which lead to a more rational use of natural resources, while adequately conserving the environment.

BIBLIOGRAPHY

Christian and Stewart (1968): "Methodology of Integrated Surveys", *Aerial Survey and Integrated Studies*, Paris, UNESCO, pp. 233-277.

Holdridge, L. S. (1967), *Life Zone Ecology*, San José, Costa Rica, Centro Agronómico Tropical de Investigación y Enseñanza (CATIE).

Instituto de Investigaciones de Recursos Naturales (IREN) (1970), *Cautín: Estudio integrado de los recursos naturales renovables*, Publ. 8, vols. I and II, *Mapas*, Santiago, Chile, p. 529.

Lizárraga, J. and others (1969), *El uso de los estudios integrados*, Lima, Oficina Nacional de Evaluación de Recursos Naturales (ONERN), p. 47.

MacPhail, D. (1971), "Photomorphic mapping in Chile", *Photogrammetric Engineering*, November, pp. 1139-1148.

Molina, C. L. (1974), "Proyecto Radargramétrico del Amazonas-Colombia", "Actas del VII Simposium internacional sobre levantamentos integrados para el desarrollo regional", Bogotá, pp. 195-204, *mimeo*.

Nunnally, N. R. (1969), "Integrated landscape analysis with radar imagery", *Remote Sensing of the Environment*, vol. I, pp. 1-6.

Organization of American States (OAS) (1964), *Investigación de las posibilidades de desarrollo de la cuenca del Río Guayas del Ecuador: evaluación integrada de los recursos naturales, Mapas*, Washington, D.C., p. 240.

____ (1972), "*Haïti: Mission d'assistance technique integrée*", vol. V. I-II, *Mapas*, Washington, D.C.

Peña Alvarez, O. (1979), "Los recursos en el marco de una geografía de América Latina", *Revista geográfica*, No. 89, Mexico City, Instituto Panamericano de Geografía e Historia, June, pp. 21-34.

Saa-Vidal, O. R., and others (1967), *Provincia de Aysén: inventario de los recursos naturales*, Inf. No. 20, IREN-CORFO, Santiago, Chile.

____ (1968), *Provincia de Magallanes: inventario de los recursos naturales*, Inf. No. 21, IREN-CORFO, Santiago, Chile.

Tricart, J. (1979), "Organización, programación y realización de estudios integrados", Seminario Regional de Estudios Integrados sobre Ecología, Buenos Aires, *mimeo*.

IV

THE PREPARATION OF INVENTORIES AND BALANCE SHEETS OF THE NATURAL AND CULTURAL HERITAGE*

by Nicolo Gligo**

INTRODUCTION

For many years now almost all the countries of Latin America and the Caribbean have been carrying out various programmes concerned in part with protection of the natural and cultural heritage. For the natural heritage, systems of protected areas have been created, usually under the responsibility of national parks and reserves or institutions responsible for protecting specific resources, such as forest or fishery resources. For the cultural heritage, the countries have developed programmes through special institutions such as Ecuador's National Cultural Heritage Institute, Argentina's Historico-cultural Heritage Commission, and the agencies in charge of museums and archives, as well as numerous initiatives taken separately in different institutions, secretariats and ministries.

The region has a wide variety of legislation on the preservation of the natural and cultural heritage, concentrating mostly on the conservation of natural resources (countries such as Colombia and Venezuela have enacted special codes on the subject) and on the preservation of historical and architectural monuments.

However, there are no global programmes for making or maintaining inventories of the natural and cultural heritage or significant initiatives to incorporate it in the national accounts, although concern about the subject is spreading in the face of the exhaustion of many resources because of high extraction rates and the past plundering of natural resources, the

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establishment of operating systems at variance with medium- and long-term norms for resource conservation, the invasion of a development style which, by considerably altering the traditional culture, tends to undervaluate and in the end neglect the cultural goods of each country, ignorance of each country's heritage endowment and limited knowledge of the ecological costs to that endowment of the development process.

A. DEFINITIONS AND OBJECTIVES OF A NATURAL AND CULTURAL HERITAGE PROGRAMME

Various statements have been made about the concept of global heritage. France's Interministerial Commission on Natural Heritage Accounting defines it as "the set of goods which have been bequeathed to us by previous generations and which, in the same way, we must pass on to future generations without having altered their possibilities for use" (France, 1979, vol. 1). This definition closely fits the general conception of what should be considered heritage, but some questions arise about what is meant by passing this on to future generations "without having altered their possibilities for use". If development is the transformation of the natural environment into an artificial environment, its possibilities for future use are in fact being altered. For example, the expansion of the agricultural frontier occurs in various forms, based on different systems and technologies whose consequences obviously alter the future possibilities for use of the ecosystems. A transformation which has a low ecological cost according to scientific and technological knowledge at a given time can have serious consequences for the future if, because of new scientific and technological knowledge, the ecological cost is assigned a new value. Any definition which includes the concept of future use possibility runs into this problem.

A more general definition was adopted by the Australian Heritage Commission (1982) which, in general terms, defines national heritage as "those places which are components of the natural environment of Australia or its cultural environment that have aesthetic, historical, scientific, or social significance or other special value for future generations as well as for the present community". Heritage is classified into three main groups: environment, national aboriginal heritage and man-made environment. The "man-made environment" refers to historical buildings of European origin (residential, religious, commercial or industrial buildings) and the national aboriginal heritage includes places of importance for the traditional native culture. These two aspects together, man-made and aboriginal, make up what can be called the "cultural heritage".

This is the definition proposed here for the concept of heritage: that set of goods which have been bequeathed to us by previous generations and which we should conserve in their basic characteristics or transform

appropriately in order to be able to pass them on to future generations. Obviously, "transform appropriately" is a relative term which depends on the perception at a given moment, of the projected use of a specific good.

Heritage is not synonymous with a set of public goods but with a set of goods for collective use, many of which may be in the private domain. The State should control the private use of a heritage good, either regulating its use or taking charge of it when necessary.

Some schools of thought tend to identify heritage with goods that cannot be economically valued. Although many heritage goods do not enter the economic system, there are many which do. Consequently, heritage goods are classified as such not on the basis of ownership or of inclusion in the economic system but by a social function of importance to several generations.

Countries which have established natural and cultural heritage programmes have done so with different objectives: some are designed to ascertain what goods exist, others to ascertain their management or, in some cases, to draw up heritage balance sheets or simply to protect and conserve these resources. The National Heritage Program of the United States of America, established in 1977, aims at identifying, protecting and, if necessary, acquiring national heritage resources and co-ordinating Federal programmes. In France a report was expressly requested from the Interministerial Commission concerning the establishment of a system of natural heritage accounting. In Norway the balances were concerned mainly with fishery and energy resources and land use. The objective in Australia has been to make a register of places of importance using scientific, aesthetic and sociocultural criteria. In this case the man-made environment is also included. Definitions of natural and cultural heritage, therefore, depend in each case on the objectives of the national programmes.

In Latin American and Caribbean countries the objectives should focus on the rapid changes in natural resources and on their loss and overexploitation. The objectives of cultural heritage programmes should be designed to counteract the undervaluation of pre-Columbian and creole cultures and the intrusion of foreign values which tends to aggravate this undervaluation.

The main obstacle in defining the natural heritage is the difficulty of establishing the line between what is "natural" and what is "man-made". The artificialization imposed on nature by the development process is a continuum from minimum to maximum. It is therefore necessary to fix an arbitrary point in this continuum which defines the dividing line between the "natural" and the "non-natural". In Latin America this difficulty is aggravated by the speed with which pristine or virtually untouched ecosystems are transformed and must soon be reclassified as non-natural.

The natural heritage should include those natural goods that have not undergone modifications or whose artificialization has been so negligible that

their natural behaviour has not been significantly altered. To this natural heritage must be added the "naturalized" goods that help to maintain the characteristics of certain resources such as land and water. These are man-made goods of historical importance and passed on from generation to generation, such as land-improvement works: platforms, terraces, drainage and even old rural roads.

The cultural heritage consists of inherited goods, places of historical and prehistorical importance places where the indigenous and foreign cultures met, pre-Columbian, colonial and post-colonial art, buildings and houses of historical or architectural interest, old industries, mines and markets, means of transport, and old-style towns.

On the basis of these definitions and of certain characteristics common to the Latin American countries, programmes to determine the natural and cultural heritage should be designed to:

a) Collect information about the resources and the systems in order to define development alternatives and stimulate an awareness of how the state of resources evolves according to the use made of them by society;

b) Regulate property rights by introducing laws that take into account the social role of resources, their long-term projections, and, in many cases, their collective usefulness as non-economic goods. These laws should provide for the drafting of new regulations and vest public agencies with powers of control and sanction. Special attention must be given to legal provisions extending the right of the State to acquire heritage resources;

c) Set up inventory and accounting systems for the natural and cultural heritage in order periodically to record change and to incorporate heritage considerations in development planning, particularly in efforts to harmonize short-term with medium- and long-term planning;

d) Publicize the main problems of natural and cultural resource deterioration and endeavour to have the inventories and balances included in educational curriculums and placed in the public domain.

B. CLASSIFICATION OF THE NATURAL AND CULTURAL HERITAGE

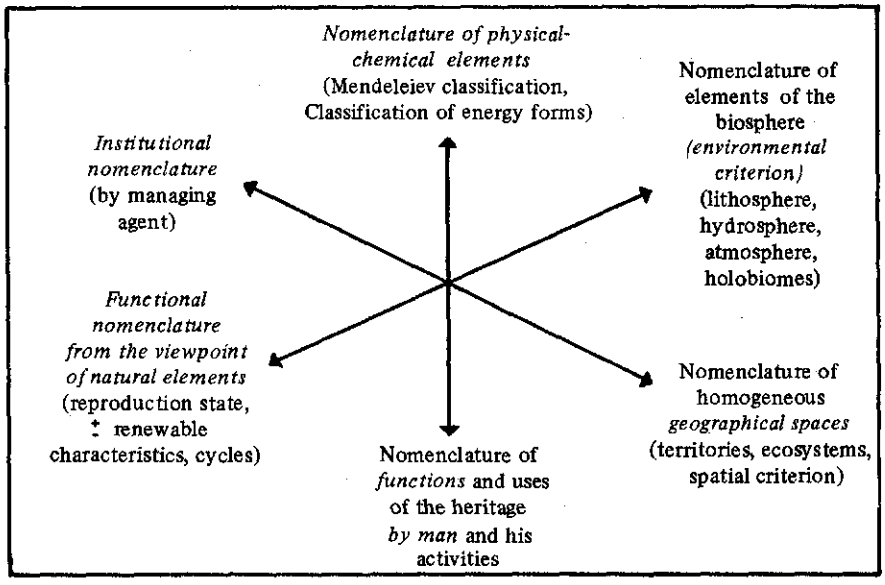
On the basis of this definition of the natural and cultural heritage and its objectives, a classification can be designed which is adaptable to the priorities of each country. Current programmes give an idea of how some countries have put together these classifications. In the United States the traditional division was made between natural and cultural heritage. Since the objectives were essentially conservationist, the cultural heritage was separated out, with priority given to ecological and geological resources and with emphasis on virgin landscapes and areas as well. The cultural heritage policy was to protect not only important places and structures, such as archeological sites

and buildings of historical or aesthetic value, but arts and handicrafts as well (annex I).

The Australian register was based on criteria for determining places or structures of importance. The idea was to prepare a national register of places in order to determine their state of preservation and establish appropriate policies. Each criterion is explained by examples of places and structures. The division made by the Australian Commission into natural heritage, man-made environment and national aboriginal heritage (the latter two are cultural heritage) omits scientific, aesthetic, historical or social criteria (annex II).

In designing their nomenclature the French, as shown in figure 1, made a synthesis into six main options and decided it was necessary to establish for each a single nomenclature encompassing the most important characteristics and relating them to the concepts of the accounting system (annex III).

Figure 1



The three examples in the annex illustrate various approaches and arrangements for classifying and grouping natural and cultural heritage goods.

For many years all the Latin American and Caribbean countries have had laws and regulations governing specific aspects of the natural and cultural heritage. Moreover, some of the heritage goods have been studied by special agencies, either sectoral (energy, mining, agriculture, forestry) or global. Natural and cultural heritage programmes should not duplicate these functions but rather integrate and complement them. For example, the sectoral mining agencies usually study specific mineral resources, ignoring those of no current economic value. The idea is that this information, already available, should be supplemented with the information necessary to complete our knowledge of the heritage.

A register or accounting system for the cultural heritage should be based on a series of definitions and decisions determined by the objectives of the exercise. This document explains the functioning of a classification based on two levels of analysis. At the first, or general level the spatial distribution of the major biomes[1] is established in order to elucidate their ecosystemic behaviour or the behaviour of some of their natural characteristics if they have been subjected to a high degree of artificialization. This general treatment determines the extent to which one specific biome is more of a "natural heritage" than another and which physical and functional resources have an effect on its valuation. The French call this concept "geographic space".

It is important to include the "naturalized" resources at the general level since, although highly artificialized, they are incorporated in and improve a natural resource and are therefore considered part of the natural heritage.

At another level the elements of the biosphere will be combined with their functions as natural elements, simplifying the nomenclature as much as possible.

The classifications can be broken down into physical-chemical elements, but it is advisable to fix the limit at the current resources entering the economic cycle, such as minerals and some of the plant and animal species.

A classification of the cultural heritage which identifies places facilitates action on the constituent resources in need of protection and it is therefore recommended. Apart from its practical advantages it permits the incorporation of all the laws and regulations that already exist in the countries for protected areas, national monuments and buildings of architectural interest.

This identification of places should not prevent the inclusion of activities such as folkmusic which are not place-specific but are carried on over the

[1]A biome is a system of biotic and abiotic components each of which characteristically corresponds to a typical physionomic or functional model (Gastó definition, 1979).

whole country or an entire region. On this basis there now follows a proposed classification for natural and cultural heritage which may prove useful for Latin American and Caribbean countries.

1. **Natural heritage**
   - 1.1. *Global level*
     - 1.1.1. Major biomes
       - 1.1.1.1 Deciduous forest ecosystem
       - 1.1.1.2 Tundra ecosystem
       - 1.1.1.3 Cold steppe ecosystem
       - 1.1.1.4 Hot savannah ecosystem
       - | |
       - 1.1.1.n
     - 1.1.2 "Naturalized" transformations
       - 1.1.2.1 Agricultural irrigation systems
       - 1.1.2.2 Canal and drain infrastructure
       - 1.1.2.3 Areas of terraces and platforms
   - 1.2. *Specific level*
     - 1.2.1 Climate
       - 1.2.1.1 Precipitation
       - 1.2.1.2 Temperature
       - 1.2.1.3 Relative humidity
       - 1.2.1.4 Wind
       - | |
       - 1.2.1.n
     - 1.2.2 Solar radiation
     - 1.2.3 Continental water resources
       - 1.2.3.1 Rivers
       - 1.2.3.2 Lakes
       - 1.2.3.3 Ground water
       - 1.2.3.4 Mangrove swamps
       - 1.2.3.5 Glaciers
       - 1.2.3.6 Snow
     - 1.2.4 Geological resources
     - 1.2.5 Geomorphological resources
     - 1.2.6 Land
     - 1.2.7 Mineral resources
       - 1.2.7.1 Iron
       - 1.2.7.2 Copper
       - 1.2.7.3 Aluminium
       - | |
       - 1.2.7.n

1.2.8 Biotic resources
- 1.2.8.1 Genetic heritage
- 1.2.8.2 Terrestrial and aquatic flora
- 1.2.8.3 Terrestrial fauna
- 1.2.8.4 Fresh-water fauna
- 1.2.8.5 Amphibious fauna
- 1.2.8.6 Marine flora and fauna

1.2.9 Marine resources
- 1.2.9.1 Coastal seas
- 1.2.9.2 Continental shelf
- 1.2.9.3 Special interest areas

1.2.10 Energy resources
- 1.2.10.1 Hydrocarbons
- 1.2.10.2 Coal
- 1.2.10.3 Hydroelectricity
- 1.2.10.4 Biomass
- 1.2.10.5 Wind energy
- 1.2.10.6 Solar energy
- 1.2.10.7 Nuclear energy

1.2.11 Landscape

2. **Cultural heritage**

2.1 Archeological heritage

2.2 Buildings, structures and gardens of aesthetic, historical, or technological importance (churches, palaces, old public buildings, bridges, dams, mines)

2.3 Art and handicrafts

2.4 Landscapes of aesthetic or historical importance

2.5 Man-made environment that illustrates lifestyles, customs, and obsolete processes no longer practiced, which are in danger of extinction (small towns, forts, mills)

2.6 Noteworthy objects and collections

2.7 Noteworthy urban settlements

Once the classification of the natural and cultural heritage has been established and its components defined, they can be itemized and entered in the national information and evaluation systems.

The characteristics of the cultural heritage make physical or economic quantification very difficult. However, some parts of it, such as noteworthy collections and objects, works of art and structures of architectural value, will have a market value. Because these are exceptional cases, the cultural heritage is restricted to describing places, structures, goods or activities which are difficult to quantify but can be described in full detail.

The quantification of heritage would be limited to natural resources.

C. HERITAGE BALANCE IN NATIONAL ACCOUNTS SYSTEMS

1. Evaluations and accounts

The enormous output of information about and evaluation of natural resources, often duplicated or triplicated, leads some technicians to think it is redundant to devise an accounting system for the natural and cultural heritage. This view results from a confusion of current systems of information, surveying and evaluation with what natural resource balances should be.

The survey and evaluation of natural resources is approached from the standpoint of stocks, and information is thus acquired about, for example, mineral resources, plants and land. The evaluations are usually limited to exploring the exploitation possibilities. For instance, land evaluations are expressed in terms of use aptitude and present use in order to determine the output potential using a specific technology with different levels of capitalization.

In Latin America periodic evaluations are commonly made in order to establish the changes in stocks. It cannot be said that these evaluations are yet made frequently enough for strict control. They are static photographs of different periods and often cannot even be compared because of methodological problems (different scales and types of remote sensor) and they cannot throw light on resource balances; but they do give an approximate idea of fluctuations in stocks.

The purpose of the balances is to measure, with a given periodicity, the flows associated with variations in stocks, so that the evolution of the heritage can be dynamically plotted. This relationship between stocks and flows is very similar to traditional evaluations of non-renewable resources, but it is much more complex in the case of renewable resources because of the deterioration and natural renewal to which they are subject.

A heritage accounting programme should bring in other indicators to broaden its interpretation, such as the determination of levels of disturbance or damage (for example, the discharge of wastes into water).

2. Location of accounting programmes for natural and cultural heritage

There are many doubts as to how to incorporate an accounting programme for the natural and cultural heritage in the national accounts system. Latin American countries have no structured or explicit systems for environment and heritage accounting, but only environmental data included in different information systems (ECLAC, 1980 and UN, 1980). The main data on and evaluations of natural resources are usually provided by the various sectors of the economy. Naturally, most information is contributed by agriculture, mining and fisheries. In some countries, information on natural resources is

also generated by industry, provided that this sector keeps a good record of inputs.

There are also national, State, provincial or departmental agencies directly responsible for making evaluations and surveys of natural resources, as well as others responsible for planning, which need these surveys and evaluations.

A natural and cultural heritage programme must be intersectoral and located at a high enough level to facilitate the integration of the data generated in each sector. It must also be in a position to furnish the data to the planning agencies and to national accounts managers. This implies its incorporation at a higher level than that of sectoral statistics and even of more general information such as environmental statistics, studies on the state of the environment, economic environmental data, and regional environment plans.

Its location will depend of course on the institutional organization of the particular country. At all events, from the proposed intermediate level the accounts will have to feed higher levels such as macroeconomic models and national accounts. It is particularly important to incorporate the natural heritage balances in long-term planning models.

D. CRITERIA FOR DESIGNING ACCOUNTS

1. Survey of assessment of three dimensions

Concern about the deterioration of natural resources in Latin America has produced a series of initiatives for creating an awareness of the dangers threatening the natural heritage. There have been studies of the general state of the environment and more specific studies of a particular threatened resource (for example, natural forests or soil erosion). Many of these studies include physical quantifications and some include economic quantifications.

Generally, these initiatives have not been as successful as hoped, because they have not been given due importance in the areas of global planning and executive management. This is due mainly to the fact that the evaluations and their balances have been prepared in isolation by the "environmentalist sector" solely as warnings of the degradation of resources in the development process. The agencies responsible for development planning have not considered it necessary to accommodate a viewpoint which makes no immediate contribution to solving daily problems.

Therefore, the first need is to define clearly the objectives of heritage accounting. In the first place, heritage accounting must be an instrument of co-operation with development planning. This is done by periodically updating information about the supply and quality of heritage resources, their potential and their ecosystemic role. Since development is an integral

concept, the evaluations should focus not only on physical-environmental resources but also, where possible, on cultural resources.

Some authors maintain that the objective of heritage accounting is to incorporate the balances in the national accounts. Although this is important, this focus could lead to a monetary bias in the accounts through the pricing of all heritage elements, for this would marginalize that part of the natural and cultural heritage which cannot be evaluated in this way (Farnworth and others, 1981). Multidimensional criteria are preferable, with monetary accounting where possible. The correct perception of the evolution of the heritage will facilitate planning to reconcile the short-term view with the medium- and long-term view. This is the basic problem of the incorporation of the environmental dimension in development planning.

If the most important objective of heritage accounting is incorporation in development planning processes, it will be necessary to establish the link between natural resources, the economic system and sociocultural factors; this presupposes analysis of the balances in three dimensions. These three dimensions have no common denominator, so that the heritage must be evaluated from three separate angles in an attempt to find the links. In other words, the same resource should be evaluated two or three times if necessary. For example, a forest could be evaluated ecologically as biomass, economically as cubic metres of wood, and socioculturally as recreational hectares. The three evaluations should overlap. For example, modifications caused by the exploitation of certain tree species alter the ecological behaviour of the forest and affect its aesthetic value for recreation.

Consequently, as suggested by the French Interministerial Commission on National Heritage Accounting, there would be three basic accounting areas which must be interrelated so that the resources are treated multidimensionally: from the viewpoints of nature, of the economy and of man.

If the objective of natural heritage accounting was merely incorporation in the national accounts, it would be sufficient to relate the natural sphere to the economic sphere by trying to evaluate the natural resource in monetary terms. In some cases the description of the relationship between these spheres is limited to the exploitation of natural resources, thus avoiding the evaluation problem, as in the case of the Statistical Office of the European Community.

In the Australian report the programme is limited to an inventory and a qualitative description of places and man-made environment. In this case the natural heritage is reduced to the sphere of nature and the cultural to the sphere of man, with only weak links established between them.

In the United States the programme is limited almost exclusively to the sphere of nature.

2. Natural heritage exploitation balances

Once the measurement units for the three dimensions have been defined, work can start on preparing the natural heritage balances. The difficulties inherent in quantifying the cultural heritage limit control to inventories or registers, and therefore the following discussion of balance preparation refers exclusively to the natural heritage.

It is not difficult to keep physical accounts of non-renewable natural resources. First, the different existing types of reserves or resources must be determined. There are various ways of classifying them. The problem lies in the degree of inaccuracy of the information about unexploited reserves. In Latin America it is quite common to find very little or very inaccurate information, for surveying is currently carried out at very general levels. Much of the information is kept confidential by companies, both domestic and foreign.

Some considerable effort has been made to survey and evaluate some resources. Special agencies of the ministries or secretariats of mines and specialized bodies such as geological or mineralogical research institutes have made significant progress in recent years, either because of the importance of the resource as a generation of foreign exchange (copper in Peru and Chile) or because of the energy problem and the consequent importance of prospecting for oil.

In general, the countries keep overall records of output and consumption, so that they can estimate the life of the reserves. The most common way of keeping records of production, consumption and reserves of minerals is explained in annex IV.

Accounting systems for renewable natural resources are much more complex. In natural ecosystems stocks can vary naturally. If an ecosystem has not reached its climax, it will tend to grow until a constraining factor begins to operate (through the law of the minimum). On the other hand, stocks may diminish when climatic or geological conditions vary and are not ideal for the climax. In this event there is a natural retrograde process which can easily be speeded up by man. "Qualitative" variations in stocks caused by these processes are very difficult to quantify.

In artificialized systems the whole problem of renewable natural resources is complicated by fluctuations in stocks caused by the development process, such as forestry plantations that increase or decline with the prevailing balance between planting and logging.

Special mention must be made of modifications in natural ecosystems resulting from processes which are not expected to affect their conservation possibilities. It has been claimed, on the grounds of general resilience parameters, that nature produces and restores the primitive ecosystem. For example, wet tropical areas are said to have the capacity to heal their wounds because of their high resilience. On this assumption, secondary or exploited

forest is measured by the same values as primitive forest. Although it is true that their high resilience gives the wet tropics greater recovery powers, it has been shown that they do not necessarily return to their primitive ecosystems. The time-lags between optimum climatic conditions and the actual climate and geological state and, above all, the ease of entry of new colonizing species, many of them aggressive, result in many interventions, no matter how slight individually, which damage the ecosystem.[2]

There is no doubt that the quantification of modifications must be backed up by scientific studies or by estimates based on them. Thus, a chart like table 1 can be prepared for each resource, renewable or non-renewable. These tables should be accompanied by complementary studies indicating vulnerability, risk, irreversibility and other qualitative characteristics in scientifically irrefutable form. It would also be very useful to indicate the links between the resource and other resources and its role within a given ecosystem. For example, the decrease in a wild animal species has repercussions on the trophic network of its ecosystem.

3. The three dimensions of the balances

There are resources which can be evaluated by ecological, economic and sociocultural criteria, i.e., in the three dimensions described above. Others can be evaluated by some combination of two or by only one of these criteria. Some evaluation methodologies make it possible to apply a further criterion to a resource which previously was evaluated in only one or two dimensions. Evaluations which do not require very controversial or complex methodologies are recommended.

Mineral resources can easily be evaluated with physical-ecological and economic criteria. All three types of approach can by applied to water and to forestry resources.

The natural forest deserves special attention because of its great importance in Latin America. For the physical-ecological analysis, biomass per forest type, measured in kilogrammes per hectare, can be used as the evaluation unit. For this type of analysis it is highly advisable to assess vulnerability and the degree of deterioration, since this information is useful for designing the necessary policies. The forest must also be analysed as a regulator of the hydrological system and the climate and as a protector of wildlife, all of which is very difficult to quantify. These evaluations can be incorporated as complements to the accounting procedures in order to classify the state of the forest.

Economic evaluation must be made on a physical-ecological basis. Since not all the forest is an economic good, the usual procedure is to quantify the

[2] This law states that, independently of the amount of resources, a biological system will always stop growing as a function of the most limiting resource.

Table 1

MAIN RELATIONSHIPS BETWEEN STOCKS AND FLOWS AFFECTING THE NATURAL HERITAGE

Resources	Uses
1. Stocks at beginning of period	
2. Increase in reserves a) By changed estimate of known reserves b) By discovery of new reserves	3. Decrease in reserves by changed estimate of known reserves
4. Gross natural increase a) Natural growth of initial stocks (forest growth) b) Natural growth by reproduction (increase in an animal species)	5. Natural decrease –By normal spontaneous processes –By natural disasters
6. Increase by better use of technology (construction of drainage works)	7. Decrease by use or exploitation a) Domestic use b) Exports
8. Imports	9. Decrease by other causes –Pollution –Different use (urbanized agricultural land)
	10. Adjustment (+ or -)
	11. Stocks at end of period

Source: France (1976), p. 26.

existing volume of exploitable timber and assign it a value. In doing this, it is very important to differentiate between stocks and flows in order to assess the degree of overexploitation or even underexploitation (over-mature species). The current unit is cubic metres per species and type of wood. The forest

produces not only timber but also fodder, medicinal plants and wild fruit, and this should also be taken into account.

The sociocultural evaluation should be made in terms of what the forest represents to the public; for example, whether it is seen as an area of educational, recreational or aesthetic interest. In this case the measurement unit should be simply the surface area. Visual sensitivity tables can be prepared and ranked by their impact on the public. The method used for this is surveys of forest users.

E. THE INTEGRATION OF NATURAL HERITAGE ACCOUNTING IN SYSTEMS OF NATIONAL ACCOUNTS

The incorporation of heritage accounting in systems of national accounts is fundamental to the integration of the concept of environment in development planning. These systems are the foundation of national economic policy and, if an evaluation of the natural heritage can be introduced, a decisive step will have been taken towards the efficient incorporation of the environmental dimension in planning. However, the national accounts indicate growth rates of goods and services only, and not of public welfare (Hueting, 1984).

Many heritage goods lie outside the economic scope of the national accounts. Other natural heritage shares common ground with them. As stated by Sejenovich and Sourrouille (1980), "in measuring the costs of environmental protection and pollution control, if there is agreement on definitions, any monetary expenditures are included in the national accounts".

The important thing about this situation is that many natural heritage goods which lie outside the common ground are directly related to public welfare. Only occasionally can their shadow prices or the demand curve of their environmental functions be determined (Hueting, 1980).

Therefore, the effort should be centered on expanding and completing the common ground to make it possible to evaluate many heritage goods and incorporate them in the national accounts. The use of other goods which are considered "free goods", such as the atmosphere, cannot be defined as an economic activity.

If no indicator of depletion or deterioration is incorporated in production accounting, the evaluation is distorted. If, in fact, a good is produced at the expense of an environmental good or part of a good and if this cost cannot be evaluated, it is impossible to determine a fair shadow price for the good in question (Theys, 1984).

The usual accounting systems amortize only reproducible tangible assets or durable goods and not natural heritage goods, even though these can be economically evaluated (Sejenovich and Sourrouille, 1980).

There are two kinds of solution; they are not mutually exclusive but, on the contrary, complementary. The first is to make an economic evaluation of

the natural heritage goods and to include this evaluation in the amortization of tangible assets. The second is to reconcile current records of flows with changes in heritage goods. The idea is to keep parallel accounts of reproducible goods (in the economic sense) and of heritage goods. The first would be the current account, in which initial stocks are added to the gross capital formation in the period and the amortization is subtracted from them. The second would be reconciliation, as described in the previous section, in which stocks and flows are physically related.

The relationship between the national accounts and the national heritage inventory and accounting system will be the instrument for incorporating the environmental dimension in development planning, if the latter remains centered on economic policy. A different conception of development demanding integrated planning, where the target is the public's welfare and, consequently, its environment and where economic policy is only a tool for attaining this target, will require modifications to this strategy and make the procedure described above redundant, since the environmental issue will be implicit in all development decisions.

F. RECOMMENDATIONS FOR A NATURAL AND CULTURAL HERITAGE PROGRAMME

Before putting into practice a programme for preparing natural and cultural heritage inventories and balances, some basic steps must be defined and then the various institutional options in the public sector analysed.

1. Suggested steps

The first step is to define the national objectives of a natural and cultural heritage programme and devise an appropriate classification. The second step is to prepare a national register of statistical inventories and other information on natural and cultural goods. This register should include for each inventory:

a) its title; b) its definition, if a programme, project or institutional function; c) the institutional responsibility; d) the geographical scope, if not covering the whole country; e) detail and extent of information; f) date of latest publication and periodicity.

Once the state of the different natural and cultural heritage goods is known their legal status must be ascertained, since in Latin America and the Caribbean there is a large number of regulations governing protected areas, national monuments, structures of architectural interest and other goods. It is also necessary to examine the efficiency of these regulations, since many of them are dead letters.

This concrete proposal should make it possible to devise a programme for natural and cultural heritage inventories and balances. It will be necessary

to specify in the general inventory the complementary information required. Once the general inventory is ready an accounting system, specifically for the natural heritage, can be prepared.

It is recommended that this system should be general in the early stages, but that specific heritage goods should be selected, according to the following criteria:

a) importance in national product (copper); b) importance in generating foreign exchange (tin); c) impact on the employment of manpower (water and irrigated land); d) deterioration level (eroded land); e) high ecological cost in the development process (native forests); f) strategic role (oil).

2. Institutions of the programme

There are many alternative ways of putting this programme, or a similar one into practice, but it is important that it be assigned the correct priority in the public administration. It should stand above the sectoral levels. This can be done either by locating it in the central planning office, by making it directly responsible to the executive authority, or by appointing a special interministerial commission.

The national agencies responsible for natural resources could be entrusted with the programme in the diagnostic phase, provided that such agencies exist in the public administration (for example, the Ministry of the Environment and Renewable Natural Resources, in Venezuela; the Special Secretariat for the Environment, in Brazil; the National Office of Resource Evaluation, in Peru; or the National Institute for Natural Resource Evaluation, in Chile).

This function could also be performed by environmental agencies in a sector or ministry, but they would need special intersectoral powers, which give rise to institutional difficulties. This is the status of Colombia's National Institute for Natural Resources and the Environment, Argentina's Secretariat for Housing and Environmental Regulation, and Ecuador's Subsecretariat for the Environment.

The operation of the programme should be the responsibility of a sectoral agency. Enactment of a law establishing the institutional terms of reference would invest the programme with the necessary authority to make it efficient.

Annex I

WORK AREAS OF THE UNITED STATES NATIONAL HERITAGE PROGRAM*

1. *Natural heritage*
   a) Ecological resources
   b) Geological resources
   c) Landscape (aesthetic value)
   d) Unspoiled natural areas

2. *Cultural heritage*
   a) Archeological heritage
   b) Architectural heritage and important urban settlements
   c) Areas and landscapes of historical or cultural value
   d) Arts and handicrafts
   e) Important objects and collections
   f) Folklife
   g) Contemporary culture

Annex II

CRITERIA FOR THE REGISTER OF THE NATIONAL ESTATE OF AUSTRALIA**

I. Natural areas

1. *Scientific*
   a) Representative ecosystems, land forms or features
   b) Habitat of endangered plants and animals
   c) Uncommon or very important land forms
   d) Fragile areas, vulnerable to impacts of human activities or natural disturbances
   e) Places of interest for the study of botanical, geological or geomorphological evolution

2. *Aesthetic*
   f) Outstanding natural or man-influenced landscapes

3. *Historical*
   g) Natural areas associated with the work of early botanists or explorers or with significant scientific discoveries

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* Taken from France (1979), vol. III, p. 7.

** Taken from the Australian Heritage Commission (1982), pp. 37, 38 and 98.

4. *Social*

h) Recreation and tourism value
i) Educational value for the teaching of natural sciences

II. Criteria for the man-made environment

a) Buildings representative of a great creative or technical accomplishment
b) Demonstration of a way of life, custom, process or function no longer practiced, in danger of being lost or of exceptional interest
c) Strong association with an important figure or figures, development or cultural phase
d) Outstanding urban or rural landscapes

III. National aboriginal estate

a) Sites of scientific interest which have a potential for science or the study of prehistory or which have figured prominently in research
b) Sites connected with creative activities such as painting, ceramics, tree carving, etc.
c) Historical sites in the contact between Aborigines and Europeans, such as mission stations, massacre sites, etc.
d) Sites of traditional importance to the aboriginal people but not necessarily to the rest of the population (these are also termed living, mythological or sacred sites).

Annex III

PROVISIONAL NOMENCLATURE OF THE NATURAL HERITAGE (FRANCE)*

1. *Inland waters*

1.1 Lakes
1.2 Salt marshes and wetlands
1.3 Estuaries
1.4 Rivers, surface waters, waterfalls
1.5 Aquifers and ground water
1.6 Glaciers and snows

2. *The sea*

2.1 Continental shelf
2.2 Seabed
2.3 Sea water
2.4 Areas suitable for fish and shellfish farming

* Taken from France (1979), vol. I.

3. *Atmosphere*
   - 3.1 Air
   - 3.2 Solar radiation
4. *Soil and subsoil*
   - 4.1 Unoccupied natural areas (including coastal and mountain areas)
   - 4.2 Vegetable mould, humus
   - 4.3 Geological substratum, rocks, land without vegetation cover
   - 4.4 Mineral resources (including sand and quarries)
   - 4.5 Ancient rural improvement works (hedges, woods, embankments, paths, etc.)
   - 4.6 Landscapes
5. *Biotic elements*
   - 5.1 Genetic heritage of wild and domestic species
   - 5.2 Species population
   - 5.3 Flower and plant species
   - 5.4 Aquatic wildlife
   - 5.5 Terrestrial wildlife
   - 5.6 Main biomes
     - 5.6.1 Forests
     - 5.6.2 Meadows and mountain pastures
     - 5.6.3 Wasteland and abandoned land
   - 5.7 Micro-ecosystems

Annex IV

RECORD OF MINERALS

1. Reserves (10^x tons)

Proved	Probable	Possible

3. Consumption (10^x tons)

National output		
+ imports		
– exports		
Available for consumption		
± Δ carry-over stocks		
Real consumption		

2. Output (10^x tons)

Base year output		
Base year recycling		
Output and recycling		
Current year output		
Current year recycling		
Output + recycling		

4. Ratios

a) *Output*
Reserves

b) *Output + current year recycling*
Output + base year recycling

c) *Recycling*
Total output
Etc.

BIBLIOGRAPHY

Australian Heritage Commission (1982), *The National Estate in 1981*, Canberra, Australian Government Publishing Service.

ECLAC (Economic Commission for Latin America and the Caribbean) (1980a), *Report of the Latin American Workshop on Environment Statistics and Environmental Management* (E/ECLAC/G.1120), Santiago, Chile.

_____ (1980b), *Report of the Caribbean Workshop on Environment Statistics* (E/CEPAL/CDCC/056), Caribbean Development and Co-operation Committee, Port of Spain.

Farnworth, E.G. and others (1981), "The value of natural ecosystems: an economic and ecological framework", *Environmental Conservation*, vol. 8. No. 4.

France, Government of, (1979), *Rapport de la Commission interministerielle des comptes du patrimoine de la nature*, vols. I, II and III, March-April.

Gastó, J. (1979), "Ecología", *El hombre y la transformación de la naturaleza*, Santiago, Chile, Editorial Universitaria.

Hueting, R. (1984), *New Scarcity and Economic Growth*, Amsterdam, New York, Oxford.

_____ (1984), *Economic Aspects of Environmental Accounting*, Washington, D.C., UNEP/World Bank. (Presented at the Environmental Accounting Workshop, 5-8 November, 1984.)

Sejenovich, H. and J. Sourrouille (1980), *Notas sobre balances de recursos naturales* (E/CEPAL/R.221), April.

Theys, J. (1984), *Environmental Accounting and its Use in Developing Policy*, Washington, D.C., UNEP/World Bank. (Presented at the Environmental Accounting Workshop, 5-8 November, 1984.)

PART FOUR

BASES FOR HORIZONTAL CO-OPERATION WITH REGARD TO PLANNING AND ENVIRONMENT

I

INCORPORATION OF THE ENVIRONMENTAL DIMENSION IN PLANNING

*Analysis and critique for Latin American co-operation**

by Carlos Collantes**

It is possible that a country considers it senseless to incorporate the environmental dimension in planning. This would be the case, for example, if by environmental dimension we understood the most routine problems of sanitation, landscaping or wildlife conservation, and if planning was interpreted as the abstract management of nominal macroeconomic variables; or if the incorporation of that dimension meant preparing for the advent of a utopia or the apocalypse. On that understanding, planning does not exist even to given an opinion about municipal projects. Between these two extremes, which are caricatures but not unreal, there is a wide variety of positions on the subject, depending on the way the environmental dimension is conceived and how the planning process functions in practice.

The starting point of this study will be to analyse the existing conceptions of the environmental dimension, in order to try to elucidate the concerns that motivate its incorporation in planning; these concerns correspond to very diverse interests and have manifold implications, depending on the situations and activities involved. There is an evident need to dissipate the confusion generated by this diversity, particularly when the aim is to promote comparison and co-operation between countries –in this case, those of the Latin American region.

In the conditions of the current crisis –where there is a simultaneous increase in idle installed capacity, unemployment, uncertainty regarding the immediate future, financial costs and pressure of debt service– the prophecies of doom, accusations of ecocide and pressure on economic agents to accept

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pollution fines and clean-up costs, seem clearly irrelevant. Clearer still is the need to review the conceptions, strategies and methods used in the conduct of development which form part of the common root of the problems of underdevelopment, the crisis and environmental degradation.

For this reason, while some economic circles attempt to overcome the crisis by reactivating the very same forces that provoked it, and while certain environmentalist circles would like to maintain the recession provoked by the crisis, citing its preventive benefits, this study posits the need to review both approaches radically and reorient them towards development. Development in this context is understood to mean the internal progress made in satisfying the needs and enhancing the possibilities of the entire population.

As a contribution towards this goal, we propose a tentative systematization of the principal approaches and trends into which the region's basic proposals and experiences in incorporating the environmental dimension in planning can be grouped. We will first present a basic approach, identifying a common and effective environmental management practice in the planning procedure of all countries; this practice can be of great relevance, even if it is not necessarily known in those terms. Next we will describe, in comparison with this practice, two main streams or approaches, to a certain extent headed in opposite directions, which are known respectively as the restrictive approach and the instrumental approach, in line with the role they can play in the development process. In the restrictive approach, which seems to prevail in the region, three main trends can in turn be distinguished, according to the impact of restriction on development; these are the deterrent, Malthusian and preventive trends.

In this way we hope to identify the diverse approaches and trends found in Latin America and also to facilitate a critical analysis of them, with a view to consolidating co-operation between countries on firm foundations rather than on implicit ones that could add to the confusion; to this end we offer some comments on each approach and trend, with a view to stimulating further discussion and clarification.

In addition to a critique, this paper presents an alternative proposal based on the instrumental approach. We believe that this approach can respond better to development and planning needs and that the tasks it implies require –and at the same time facilitate– effective Latin American co-operation in the matter.

The brevity of the paper and its exploratory character make some of the proposals, concepts and critiques appear oversimplified; we hope that this will be corrected, together with the inevitable errors, at the working meetings for which the paper has been prepared.

A. BASIC APPROACH

When the term "environment" is understood in its original sense and is applied to a specific society, it can designate in general terms the set of physical factors determining the existence and reproduction of that society, either as means of securing resources or as a place of settlement, in its natural state or in its subsequent transformations. Consequently, the term encompasses the entire territorial and infrastructure base which has a real or potential use value to that society, from the ecosystems and other natural processes to the towns and other forms of settlement, including the different sources of matter and energy, renewable or not under exploitation or in reserve.

Understood like this, the term "environment" can also be said to designate the material conditions that are fundamental to economic production and reproduction and to the existence and reproduction of the population, conditions in which the greater part of the process of social accumulation takes place.

One of the essential functions performed by the public sector in any country is indeed to provide the basic elements for accumulation in order to ensure the physical permanence and sustainability of the economic and social system as a whole; some of the more important of these elements are national sovereignty, large-scale and indivisible factors, and the questions of collective benefit and free goods. To that same end, the public sector also provides services designed to promote better knowledge and development of the environmental elements which it does not supply, as well as attending to ordinary problems of sanitation, conservation or interference in the use of a specific environment.

These functions, although not necessarily termed environmental, are undertaken, as is common knowledge, through various administrative sectors and in different agencies, such as research, information, production, operation and maintenance, legislation and administration, control and supervision, etc., and, relevant to this paper, planning. As these activities together absorb a high percentage of public expenditure, in terms of both operations and investment, we can conclude that where effective planning systems exist, the environmental dimension is one of the most important issues they handle, dealing as they do both with its real aspects, mainly related to sectoral, corporate, regional and municipal planning, and its nominal aspects, concerned basically with global planning and with budget and public investment programming.

When no planning exists, the environmental dimension does not lose importance in the public sector, but in these cases –which could be a majority– the thing is to propose the need to incorporate planning in environmental management and not the other way around.

From this standpoint, it might seem redundant to propose incorporating the environmental dimension in planning. Although these are difficult and unresolved problems, it cannot be said that the theme is not incorporated in planning or is incorporated only marginally. However, discussion of the subject over the past 15 years, with clashes of markedly different interests at the international and national levels, have contributed to a somewhat different view of the environmental dimension. Old problems are perceived in a new perspective and new themes and perspectives have emerged with sufficient impact to prompt the concern, if not actually to incorporate them, then at least to encourage their incorporation in planning, and to achieve this in collaboration with other countries.

While the common attitude is to attribute new environmental problems to an accentuation of the traditional problems of the deterioration of the environment's different components, the problems that have emerged in the planning and development debate are far more significant. They can be said to concern the ability of society to understand, plan and manage its relations with the environment in the development process, be they relations of knowledge, production, accumulation, appropriation, use or conservation of the environment.

Among these types of problems, the following can be mentioned:

– The meagre knowledge and ineffective use of a major part of the territory of the region, particularly in the sparsely populated wet, arid and mountainous tropical ecosystems and in the arid temperate zones;

– The limited internal capacity to understand and respond discriminately to the particular opportunities and challenges that each ecosystem poses to development;

– The passive role on the international stage that limits our means of controlling the use of our sources of raw materials and frequently favours their degradation or forced abandonment, owing to our feeble control and poor terms of trade;

– The increasingly restricted and alienated perception of the possibilities and the use values of environmental resources, as well as the technical options that could make them accessible and profitable;

– The predominance of an imitative pattern of accumulation which requires excessive environmental changes in order to adapt to sophisticated production patterns, thus doing much to increase the size of the energy, capital, imports and foreign-debt problems that characterize the region's investment crisis;

– The inequitable distribution of the ownership of the environmental resources thus accumulated, and the unequal participation in the costs and benefits that such changes involve, even in the case of collective consumer goods; and, as a result of all this,

– The persistent frustration of many human needs and possibilities in a context of a vast underutilized environmental potential.

To confront this reality it is necessary to delve into very deep structures and relationships –far deeper than those involved in the problems of deterioration– both at the domestic and at the international level; these structures and relationships belong mainly to the public sector, and particularly the planning bodies. On the other hand, the day-to-day, concrete ability to respond to all these problems depends on a multitude of creative and reforming efforts which, although dispersed at present, could be enhanced by means of State intervention at the planning and organizational level.

A large part of this task has yet to be undertaken in many Latin American countries, which is a good reason for encouraging consideration of the environmental dimension in planning, and the task is sufficiently important to merit the effective support of horizontal co-operation. However, as we stated earlier, approaches to incorporation differ radically and include essentially a restrictive approach and an instrumental approach depending on the effect on development.

B. RESTRICTIVE APPROACH

The prevailing current of interest seeking to incorporate the environmental dimension in planning in Latin American countries flows from the sectors concerned mainly with protecting the environment, either as an abstract whole or in respect of certain specific components. These sectors value environmental conservation, equilibrium and quality as superior factors of the quality of life and, therefore, as independent and superior objectives of development. They also consider that the measures for attainment of these objectives are totally insufficient and that environmental degradation is increasing in an alarming and widespread way; for these reasons they stress the urgent need for more coercive intervention by the State and greater incorporation of this dimension in planning, and for strong restrictions to be imposed through these means on growth and development.

Right from the start this restrictive approach has had a manifestly external impetus, similar to what is probably expected from a programme of horizontal co-operation. This impetus has produced a remarkable similarity in the way this issue has been dealt with in different contexts, especially in debate, and it has already gained a place of its own, particularly in the diagnoses and statements of intent that usually form part of planning documents.

However, within this same approach positions are very varied as to the type and degree of restriction that should be imposed, as well as to the sphere in which it should be imposed; these positions can have equally varied repercussions on development and planning. In our analysis we have grouped the different positions contained in this approach into three major trends,

depending on the main effect sought by restriction. These trends, designated deterrent, neo-Malthusian and preventive, are outlined below.

1. Deterrent trend

This trend groups together positions that regard environmental protection not only as a "dimension" of development but as a "conception" of development. This trend, which can be termed "environmentalist", takes the objectives of environmental conservation, quality and equilibrium as far as they can go, attaching higher value to the component elements –either for their intrinsic worth or for the value they have acquired in the past– than to their present and potential use value. Accordingly, this approach tends to reject the current growth pattern, not in itself or in terms of a growth alternative, but in terms of deterring growth as such and some of its main material manifestations, such as the increase in the mass of goods produced and consumed, industrial activities, the size of large cities, the magnitude of many infrastructure projects, technological requirements and economies of scale, etc.

Although some of these proposals are reasonably well received in technocratic sectors, they are evidently very far removed from the planners' concerns and immediate obligations. But it is proposals on the subject of the environment that provoke strongest reaction, in that they advocate a view of development that is opposed to the "economic" view prevailing in the central planning bodies and in the actual life of many Latin American countries.

The latter view, as is well known, measures, development in terms of the growth of macroeconomic variables and proximity to the levels attained by industrialized countries for these same variables. However, an implicit assumption in this view is that proximity to these levels will necessarily lead to proximity in the material standard of living of those countries, and that it is therefore necessary to follow the same methods of accumulation that are used and created there. As these methods sometimes involve substantial physical works, the acquisition and transfer of structures, equipment and projects tend to become the main concrete objective –and sometimes a synonym– of growth and development, even at the expense of the environment itself.

As long as the environmentalist opposition takes its stand on this ground of the apparent (physical) manifestations of the growth pattern, it can only produce a doctrinal dispute with the economic position; that is as superficial as it is useless when regarded from a development perspective. On the one hand, a false dilemma arises between holding back in order to protect the environment or growing and destroying it; in other words, between remaining poor but pure, or aspiring to be rich but polluted.

On the other hand, this dispute conceals the real causes and mechanisms that make it difficult for our countries to come up with a satisfactory answer

to this false dilemma, either in terms of growth or of environmental protection, or of the relations between the two.

As we have already stated, a major part of the population tends to be excluded from such growth and protection and lives in conditions of poverty and environmental degradation (without meaning to imply that these problems have equal value). Additionally, the present growth pattern leaves most of the environmental potential underutilized and unnoticed; and the potential which is used to meet the requirements of the international situation is subject to external control. Imitative methods of accumulation certainly require excessive environmental change but, because of their cost, they also limit growth itself. Their use undermines the capacity to develop domestic methods and wastes the local resources, thus perpetuating the idea that the only way for production forces to progress is to follow the course charted by the industrialized countries, whose methods are the most advanced and efficient in all respects –ecological, economic, cultural or even with regard to the sociopolitical system.

Thus, the tendency is to limit our powers of control and our ability to use the environment to satisfy our own needs and make vigorous use of our human potential. In these circumstances it seems inevitable, for example, that the reactivation sought today should basically stimulate the same pattern of growth and accumulation and the international role generated by the present crisis, including production and environmental conservation. In this regard it is useful to remember that environmental investments generated a sizeable proportion of the current debt in the first place, that these investments were necessary to ensure the functioning of the rest of the investments made under the same model, and that many of the public works required today (with or without massive job creation) will only tend to reactivate and reproduce this same process.

It is obviously impossible to stop growing if there are increasing needs to be met, and as long as this is the case any policy of deterrence is senseless, apart from the fact that making the environment an objective in itself constitutes a fundamental reversal of values. Furthermore, if in the expansionary euphoria of the past decade the diversion of resources to increase environmental protection was considered a luxury, in our current recessionary plight it should appear almost obscene; paraphrasing what was said at that time, few today would deny that "if reactivating the economy involves pollution, let us welcome pollution". What is not so apparent is that this is the only or best way to reactivate and grow, or that we are inevitably incapable of conceiving other options and putting them into practice.

Thus the dispute between the economic and environmentalist positions contributes in no way to development, growth or environmental protection in Latin America. Consequently, it would be absurd to support the deterrent position which has promoted this dispute and, even more so, to incorporate it in planning. When this has been attempted the result has been a superfluity of

wordy and hackneyed denunciations, proofs, statistics, reports and assessments of environmental damage, all in a-vain-attempt to enter this in the accounts as the biggest liability of the limited and limiting growth that is planned in some countries today.

2. Neo-Malthusian trend

As these contradictions between the economic and environmentalist viewpoints do not affect the root causes of the problems, they can be solved with relative ease at the ideological level. One way of doing this is to resort to propounding utopias such as those that have proliferated over the past few years, with their plans for parallel developments and balanced and timeless spaces, conflict-free and replete with lasting equilibrium (apart from other characteristics) between society and its environment. As these proposals generally tend to overlook the complexities and contradictions of geography, history and actual political commitment, this type of utopia is of little interest to development, to planning or to this paper.

Another more significant way of doing it, and one which deserves greater attention, is through the ideological support that both these approaches can give the neo-Malthusian stances, particularly with regard to moral and demographic coercion of the poor sectors of the population.

This support can take several forms. In the economic approach, for instance, it is useful to bear in mind that imitative growth patterns require a continual increase in the use of scarce and exogenous resources –especially capital, credit and technology– and that this increase is greater the higher the per capita level sought. As capital and credit inflow cannot grow indefinitely, and as more capital and credit are required the more alien the ecosystem into which this technology is to be introduced, the scarcity becomes doubly acute as this pattern spreads throughout Latin America.

In these circumstances the only way to overcome this scarcity while protecting the dominant interests of the system would be to curtail the population growth of the more prolific and excluded sectors, which is a similar conclusion to that reached by the environmentalist approach in its more extreme views regarding the limits that the environment and the planet set on population.

As will be recalled, this type of conclusion based on apocalyptic models was rejected by many countries for that very reason, and a Latin American president described it as a form of "unspeakable racism".

However, there are other, apparently more objective arguments, that can furnish much stronger support for the neo-Malthusian stances, even if unintentionally. For example, when for the sake of future generations, the quality of life, the genetic heritage, or for other reasons, the expansion of towns at the cost of land and the expansion of farmland at the cost of forests and other virgin ecosystems meets with firm opposition. This opposition

might be justifiable in separate and distinct cases, but if grouped together under one sole proposal and given a general value, it becomes a simple repetition of the rigid-limit view of the planet, where there is no room for more inhabitants, either in town or countryside.

Something similar occurs when growth is opposed in arid zones because it is supposed to foster desertification; in mountainous areas because it can aggravate erosion; in wet tropical forests because it would destroy the lungs of the planet, etc. It has even been said that "population saturation" is occurring, even in the Amazon region, which –with over 600 million hectares– accommodates fewer people than El Salvador or Haiti, with 300 times less area.

As in the deterrent trend, this type of argument still conceals the more profound causes and mechanisms, with the result, for example, that we are ignorant of the functioning and potential of the above-mentioned ecosystems, which make up the greater part of the Latin American territory. But it also results in ignorance of the effective restrictions imposed by those ecosystems; for instance, in the case of the vigorous wet tropical forests, where most of the imitative accumulation in agriculture and roads is not only costly but also dramatically ephemeral; or in the case of the awesome mountain ecosystems, where imitative methods frequently prove to be economically unfeasible or technologically backward in relation to the age-old methods of biotic resource use and conservation, etc.

The neo-Malthusian positions need to suppress the anxieties and take up this type of problem as a challenge to our capabilities, which is the only way we can find an adequate answer to the size and growth rate of the region's population. In this sense, in addition to rigid limits, these positions postulate a supposed law of the diminishing return of nature, entailing not only the need to curb the population growth rate but also to start reducing the total number of inhabitants as quickly as possible, a conclusion similar to the one which might be reached in light of a proposal for a more equitable distribution of socially produced goods in conditions of scarce financial resources and inexorable environmental limits.

It can thus be concluded that, when confronted with each other, the economic and environmentalist stances unite, curtailing real development possibilities and maintaining a *status quo*, which increasingly requires the population to adapt to the pattern of growth and environmental protection, instead of the other way around.

In these conditions environmental protection concerns can indeed be accommodated, and it is frequently useful to incorporate the environmental dimension in planning by following this trend because, using environmental arguments or pretexts, it tends to reinforce certain neo-Malthusian options that have been adopted in development plans for economic reasons.

For example, in the diagnosis of the situation the poor sectors can be shown to be (partly) responsible for their conditions of poverty and low

standard of living, owing to their demographic oversaturation in the rural or urban areas to which they have precarious access. At the political level this type of argument can be used to substantiate different kinds of coercive measure, as well as justifying the exclusion of vast sectors of the population from the benefits of growth and imitative accumulation, which require so many scarce resources.

3. Preventive trend

The prevailing attitudes in Latin America's attempts to incorporate the environmental dimension in planning can be grouped around the preventive trend, which views the introduction of environmental protection measures as a means of preserving the development style rather than changing or curtailing it. In other words, the idea is to grow but without degrading or polluting the environment, using planning as a decisive coercive means of imposing corrective, preventive and conservation measures when they cannot be imposed by other means.

To this end attempts have been made in some cases to combine all environmental protection responsibilities into one sole normative, executive and supervisory body, in charge of drawing up all general plans for environmental protection, to be subsequently expanded and assigned, through the administration, to the global, sectoral, corporate, regional or local planning agencies. In this way, increased incorporation of the environmental dimension would consist in collecting together all the protection measures that are handled separately in the basic approach into one strong body; and this body would have nationwide authority, exercised through the planning system. Although this procedure can be effective in enforcing certain ordinary preventive measures, it tends to undermine the value of the planning system entirely. It can turn it into some sort of disciplinary or quality-control agency, and it would be subject to a system of bureaucratic information and red tape as complex and luxuriant as the environmental systems themselves.

In other cases a more selective use of planning has been attempted as a means of imposing measures more suited to its own functions. For example, attempts have been made to impose compulsory environmental impact statements or the polluter-pays principle, making the assignment of priorities or incentives within the plan dependent on compliance, especially in the case of large-scale public works. As proof that these measures are not necessarily restrictive, reference is made to the experience of industrialized nations where coercion of this type has favoured greater growth: technological innovations make more efficient use of the environment and the resources and amount, therefore, to prevention.

Attempts have also been made to use planning to reorient certain global social processes which are held to make a more substantial contribution to

environmental degradation; these processes include metropolitan and industrial concentration, the reversal of which also constitutes a prime vindication of the most conventional regionalistic positions.

It is possible that proposals such as these may conceal the protection of very simple and strictly environmental interests, although they sometimes exhibit a very narrow outlook that can seriously affect other interests. For example, imitative industrial deconcentration has been known to cause severe damage in cases where the recipient region is not adequately organized, or in ecosystems whose behaviour is little known.

However, proposals of this kinds can also result from the general ignorance of certain global phenomena, which can lead to excessive optimism or naivety in some cases and to the abandonment of realism in others; this can be so extreme that, on occasion, the application of the proposed measures can produce a result directly opposite to the one expected.

Examples of optimism include the assumptions on which some of the proposals for deconcentration are based, three of which are worth highlighting: *First*: the failure to put deconcentration into practice earlier was due to lack of motivation, which is now provided by the present state of environmental degradation and the objectives of prevention. *Second*: the belief that concentration is the main cause of deterioration, that it can be reversed and that, once deconcentration is achieved, the desired prevention will have been attained. And *third*: the belief that deconcentration can be achieved through the available planning instruments and, should that not be possible, prevention is reason enough to change the planning instruments accordingly.

Similar arguments can be offered in respect of other preventive objectives which seek a greater incorporation of the environmental dimension in planning. But it is perhaps more useful to outline some examples of the paradoxical results of the abandonment of realism and the almost total disregard of the reality of the situation which is to be avoided through corrective, preventive or conservation measures.

a) *Corrective measures*

Corrective measures generally relate to the introduction of additional devices into existing facilities in order to mitigate, treat or recycle harmful emissions or to repair damage that has already been done. When this move follows the imitative pattern it not only results in increased capital asset costs but also requires the import of these devices from the central countries that produced the equipment whose effects are to be corrected. This process, which stimulates technological innovation and the generation of new markets and investment opportunities, is precisely one of the means by which protectionist coercion promotes growth in the central countries while

simultaneously accentuating the dependence and the intensive use of energy, capital, imports and loans for investments in the peripheral countries.

In the case of the installation of anti-pollution filters in automobiles, it is worth adding that, as the measure only seeks to avoid the pollution caused by motor vehicles, in the long run it not only supports the automobile industry but also tends to make more tolerable the proliferation of automobiles –and the subsequent demands for infrastructure, energy, space and other expensive environmental elements. This does not imply of course that we should accept uncontrolled vehicle pollution or that, in the name of development, we should accept the transfer to our countries of inefficient and polluting equipment that has been discarded by the industrialized nations. It simply shows how corrective measures can form part of the feedback mechanism of the current growth pattern and the restrictions this pattern imposes, even on environmental quality. The discarded equipment might in fact prove so harmful that we could end up buying corrective devices from the same suppliers at a higher than expected cost, or the sectors using the equipment could lose competitiveness even before applying those corrective measures, owing to the appearance of more efficient (less polluting) alternatives in the central countries.

One of the more harmful corrective and feedback procedures is the reversal of the "polluter-pays principle", which gives polluters who pay the corresponding fine the right to go on polluting. There is the example of a public lake where fish stocks were destroyed by pollution from a State-owned industry located on the shore, which kept on operating, using the same methods, after compensating the injured fishermen. As a result, consumers now pay more for fish and for the products of that industry; furthermore, the lake continues to be polluted and when its restoration becomes necessary it will also be the community –and not the polluter– who will pay. Alternatively, the ruined lake may be sold off to private interests at a heavily discounted price, and then –by means of some investment– recover its complete use value; in this case the community loses the lake for ever, the polluter receives the sell-off value and the purchaser makes profits from the restored asset.

b) *Conservation measures*

As we mentioned in the basic approach, conservation measures relate to the system's primary need and responsibility to keep the accumulated capital and environment working. However, important development-restriction mechanisms also operate in this sphere, not only at the economic level but also in social relations, and these restrictions could be boosted by thoughtless insistence on strengthening conservationist coercion through planning.

For example, the imitative pattern attaches greater importance to infrastructure renewal or the continual introduction of new infrastructures

("to build is to develop") than to their operating conditions, including the environmental conditions.

In some familiar cases, such as the large dams, this neglect is exhibited in a notable loss of efficiency both in infrastructure and the production derived from it, as well as in injury to the population dependent on other environmental resources forming part of the operating conditions of that infrastructure. As this involves problems of the conception of this type of project, as well as the attitudes to development and the interests at stake, if the proposed conservation measures do not affect these attitudes or dominant interests, in the long run it is often necessary to resort to major surgery which, like corrective measures, increases the already high cost of this form of accumulation.

In other less familiar cases it is possible that those interests may dictate an early obsolescence programme, whereupon any proposal for further conservation measures will simply be ignored. But in most of the Latin American territory it can be said that, within the imitative pattern, none of these measures –be they for environmental use, transformation or conservation– come equipped with the necessary basic knowledge about the setting in which they are to operate. This lack of knowledge –at times ignored and at times concealed under the assumption of the industrialized countries' superior knowledge and production forces– has repeatedly led to very costly mistakes (and white elephants) in Latin America; for example, in certain public and private agroindustrial settlement programmes in wet tropical regions. In these cases conservation measures are usually proposed only for preventive or growth-inhibiting purposes but do not help to lessen the uncertainty, risk or cost of investments, or the ignorance of the natural setting.

In such conditions it is not surprising, nor can it be ignored, that most of the conservation measures in our countries –whether concerned with protection of the environment or of other capital goods or consumer goods– in fact constitute a disproportionate prolongation of the useful life of these elements, and this prolongation, although not based on imitative methods of accumulation, helps to mitigate –even if only precariously– the exclusive character of the growth pattern. Among the more notable examples of this mechanism are the multiple and ingenious "informal" (non-imitative) procedures by which producers excluded from the "formal" stages of accumulation and growth conserve and recycle any material or environmental element discarded in those stages which might have a use or exchange value, thus ensuring their survival, even if it is a squalid one.

Proposals for stronger conservation measures tend to overlook these types of phenomenon and in some cases even seek to institutionalize them. Incentives are offered to informal ingenuity without changing its status, thereby ensuring the reproduction of the operating relations between the formal and informal sectors and, in passing, adding a special connotation to

the international division of labour, in the sense that it falls to our countries to conserve, as best they can, what others can transform at will.

c) *Preventive measures*

Similar arguments could be offered in respect of preventive measures as were offered in the previous two cases, except that in this case they would refer to a preliminary stage of accumulation. It would only be necessary to add that proposals to implement new preventive measures at the planning level sometimes in fact serve to reinforce individual interests that are threatened by collective interests. The best known cases are proposals that, under the pretext of preventing environmental degradation, attempt to curb the expansion, for example, of mass tourism, collective recreation or low-income settlements, which would threaten the use of the same environments for élite tourism, exclusive resorts or middle- and high-income housing development.

These examples highlight the need to state explicitly the interests that are involved in or affected by any use or change of use of the environment, so that they can be dealt with at the corresponding political level and not remain in supposedly impartial terrain where conflicting interests are cloaked under impossible "environmental conflicts", a situation which in itself sometimes only accentuates the real conflicts. This kind of abandonment of reality can occur in some measure in compulsory environmental impact statements, frequently considered to be one of the best instruments for preventive purposes, as well as one of the most compatible with planning. However, this instrument can also become divorced from planning itself, when it is designed not to offer, compare or generate options, but rather to issue *ex post* opinions on options that have already been selected from certain response categories already selected –in view of their compatibility with the imitative pattern– to solve specific problems.

Attempts are sometimes made to use this instrument to evaluate the entire context (or environment) in which each specific project is to be located, but solely for preventive purposes; this procedure represents exactly the opposite of planning, in addition to being much more costly and different in purpose.

If the merely instrumental character of the environment and its protection were to be accepted, and a real conception of planning existed, it would be more logical –even for preventive purposes– to formulate one single plan (for example, environmental zoning or regulation) providing, *ex ante*, several siting options for each type of activity whose establishment is considered necessary or plausible in a locality or region. This requires integrated and updated knowledge of the location and of the technological processes for which this location offers not only the least risks but also the best siting advantages.

In sum, the adoption of this trend would not appear to be very significant, in terms either of planning or of growth, or of environmental protection; this could explain the lack of success in persuading planners to assume a more coercive role than that normally undertaken by the State in the basic approach outlined above. Its adoption leads to a distortion of planning functions and methods. And if this coercion were to be successful, the existing restrictiveness of the growth pattern for vast sectors of the population might possibly increase even further. Moreover, if based on a naive or unrealistic perception of social realities such coercion could impair both growth and the environment.

An instrumental approach like the one proposed in the following section does not exclude measures such as those outlined in the restrictive approach; but its meaning and scope –and even its chances of success– vary substantially when the environment and its protection are regarded as subordinate to other objectives and measures used in planning. The idea is not to inhibit or restrict, but to use the environment as a function of development.

C. INSTRUMENTAL APPROACH: BASIS FOR CO-OPERATION

1. Prospects of the restrictive approach

All that has been said indicates that in Latin America the prospects of achieving greater incorporation of the environmental dimension in planning, using a restrictive approach, are very limited. This approach certainly frustrates any attempt to establish better environmental protection, keeping alive the sterile controversy between the economic and environmental viewpoints and producing arguments that, in the long run, may be used to endorse powerful interests that are contrary to development. Furthermore, it maintains a certain state of confusion involving, on the one hand, rejection of other contributions on the subject, although they may not pursue restrictive or environmental protection aims, and, on the other, obstruction of conceptual progress in this sphere which could contribute substantially to development and planning.

In this regard it should be stressed that the debate over the past 15 years on the subject of environmental protection has also contributed to a clearer perception of the fundamentals of development, redirecting to this purpose some of the most important conceptual instruments, three of which are especially worthy of note. The first concerns the systemic interdependence of the components of the material situation; this has enhanced the perception of complex relations and exchanges, not only between the environment and the social activities it sustains but also between different activities usually considered to be independent. The second concerns the diverse and specific nature of ecosystems; it has contributed to an understanding of their

substantial disparity from the evolutionary and development standpoints, as well as of the opportunities and challenges they offer for economic production and reproduction and for the settlement and reproduction of the population. The third concerns the decisive role played in these relations by certain mediation and regulation processes which, in the case of development, relate principally to cultural education, scientific and technical progress and intensification of the rate of social organization and education.

Contributions such as these could prove a valuable aid to planners, helping to clarify their perception of the real variables upon which they act every day, supporting their intersectoral and interregional organization and co-ordination responsibilities, as well as their communication with the people; increasing their understanding and management of the deeper structures and mechanisms affecting environmental development and use, etc.

However, these possibilities are hindered by a thoughtless insistence on the restrictive approach, which, having failed to motivate planners throughout a campaign lasting 15 years, is hardly likely to arouse any enthusiasm for an additional attempt at horizontal co-operation using the same approach. It is more likely that co-operation on these terms would continue to interest only those sectors concerned with environmental protection, transferring the controversy with planners from the domestic to the international level.

In these conditions it is perhaps not too adventurous to say that if the aim is to increase the efficiency of environmental protection beyond what is normally achieved by the State, it might be better not to insist on increased incorporation or intrusion in planning; this could be counterproductive both to planning and to environmental protection. Instead, it might be useful to boost the multiple efforts to perfect specific protection measures undertaken by various public sector agencies and by the population itself, in which the co-operation between Latin American countries has proved an invaluable aid even when no effective planning exists.

The advantage of a proposal such as this is that it would at least release important latent contributions, which can be made through incorporation of the environmental dimension for the purpose of development; in other words, incorporation based on an instrumental approach.

2. Need for an instrumental approach

If environmental management is acknowledged to be one of the main responsibilities of the State, involving activities such as the provision, accumulation and conservation of the more strategic material bases of development, it is easy to acknowledge as well that greater incorporation of the environmental dimension in planning cannot be justified mainly for preventive purposes. According to the arguments set out in section I, it is not a question of dealing with a greater amount of environmental problems but to

confront more fully the complex development problems in which the environmental dimension can play a relevant role.

Persistent contradictions, such as unsatisfied social needs in a context of misused environmental potential, or the high cost of the imitative capitalization of this potential *vis-à-vis* the regressive nature of their use and conservation, point to serious deficiencies or errors in the conception and planning of development. At the very least we can say that they reveal ignorance of the environment in most of the region and passive management of the mediation processes of social and environmental relations, apart from the inequality and exclusiveness of the growth pattern.

Processes as vital and strategic as those related to the social use of the environment cannot be entrusted blindly to an inevitable exogenous advance of production forces, or to invisible market forces. The proposal of greater incorporation of the environmental dimension that occurs at present at the State and planning levels is designed precisely to increase the capacity of society to deal with these relations, a paramount condition for the possession, valuation and use of the environmental base to a fuller and better degree in order to promote its own development aims and acquire a more active role in the international scene. In other words, this involves accepting that the environment is merely an instrument (a condition) and not an aim of development, and also that it is a little-used and badly used strategic instrument in our countries.

Whereas in the restrictive approach the question seemed to be what to do about development in order to enhance the environment, in the instrumental approach it is what to do about the environment in order to enhance development. That is to say, what to do to satisfy social needs and activate society's capacities, bearing in mind that environmental use and conservation should be all the greater when the needs are more pressing and all the better when capacities are improved. It must also be kept in mind that environmental quality should only be a result of development and not a determining factor to be imposed by coercion.

To provide an answer to this question it is necessary to take a comprehensive approach to the environment, not as a constraint but rather as an opportunity and a challenge, even when the aim is to ensure its fuller protection. It is also necessary to abandon the passive consideration of certain processes, such as technological, cultural and organizational ones and seek instead to strengthen them internally and turn them into vital means of responding to that opportunity and that challenge. This type of approach does not add further costs, controls or uncertainties to the many already imposed by the current growth pattern; it simply acts within this pattern, aiming to diversify and facilitate the available options in each environment and every situation and also to stimulate other internal forces that can contribute to the changes.

In other words, the proposed approach recognizes the environment as a valuable instrument, both for development and for planning purposes, whose importance does not derive from its intrinsic qualities but rather from the role it can play in the attainment of important development aims. This approach can be much more effective in its scope than the restrictive approach, even in tackling problems of deterioration: on the one hand, because it is more in keeping with the concerns of planners, who also tend to have a more realistic view of the political, social and international implications of increased environmental incorporation along the lines suggested; on the other hand, because it would release and channel towards development the many different inputs, research studies and other valuable activities of sectors interested in the environment as a central topic, but which are at present obstructed or ignored by planners because they are identified solely with the restrictive approach.

Experience shows that it is possible to attempt this, even though the approach is as yet not far developed. In any event, it indicates the need to make the attempt in order to create better conditions for development, arouse greater interest in environmental issues on the part of the population and planners, and make any regional co-operation efforts in this field worthwhile.

3. Areas of co-operation

The instrumental approach seeks to contribute to development and planning in qualitative rather than quantitative terms; to knowledge and interpretation rather than specific information and tools; to the generation and conception of development and its strategies rather than its final manifestations, either in the environment or in planning documents.

In this context it is difficult to propose specific subjects of regional co-operation, especially in view of the complexity and diversity of subjects such as the ones we have analysed and the as yet scant experience of applying the instrumental approach. For these reasons, and simply as a starting point, we suggest two large areas of co-operation: conceptual review, and strategy design.

a) *Conceptual review*

In the review of the conceptual aspects there are at least two types of priority task for co-operation between planners and theorists of Latin American environment and development. One relates to certain interpretations of past development and its current material possibilities, especially in contexts where the ecosystem is less known or exploited. The other relates to certain locomotive ideas that inform strategic design but are the subject of intense debate or profound controversy by reason of their ideological, social and environmental implications.

As regards the review of interpretations of development, one example is the need to confront and respond to basic problems such as those indicated in section A, which were summed up as the contradiction between the persistent frustration of multiple human needs and possibilities and the vast underused environmental potential. The questions that would merit attention in this respect include the following: How much of this contradiction is due to deficient or erroneous knowledge of the territory and its ecosystems? To what extent could changes in State ownership or State intervention at the planning level alter the situation, particularly in cases where it is already the main owner of these resources and planner of their use (or where it is mainly responsible for their misuse)? What manifestations, causes and effects does this contradiction have in different ecosystems, especially in the wet tropics, in mountainous areas and in arid zones? What role is played in each case by the sociopolitical régime, demographic factors, patterns of accumulation, international role, etc.?

The "locomotive ideas" that would merit serious review include the ones which support the economic, neo-Malthusian, utopian or other views, which are marked by a fundamental bias in their perception of the environment and its resources and limitations that can lead to extremely costly errors, either of commission or of omission. It is worth recalling in this connection such dangerous axioms as the natural and fixed character of material resources; the general scarcity of resources in our countries; the universal superiority of the one sole path to scientific and technical development; the nationwide validity of national and sectoral strategies regardless of ecosystemic differences; and overpopulation and the general fragility of nature, and so on.

b) *Strategic design*

Finally, perhaps one of the most fruitful things to do –at the domestic and regional co-operation levels– would be to include basic action criteria in the design of development strategies, such as those mentioned in section I, criteria which have shifted back from concern for environmental protection to concern for development. This form of environmental incorporation can have a diverse and sometimes a decisive impact on planning, even if it is not mentioned explicitly in the plans (it may be a question, for instance, of choosing one course of action instead of another, with neither of them having any apparent bearing on the environment).

However, for illustrative purposes we outline below some more general contributions that those criteria can make to planning in its different spheres, contributions which have begun to materialize, in some cases even through regional co-operation efforts.

i) *Differentiation of the development strategy.* The idea is simply to acknowledge that the differences between one environmental context and another, especially those of an ecological nature, can require substantial

variations in the strategies proposed at a national level. They can even involve totally different strategies in some respects, in order to enhance the specific capacity of each ecosystem and its respective social formation, as well as to take into account the differences and complementarities between different contexts.

This contribution is particularly significant in national planning, whether concerned with global, sectoral or corporate issues, and it has started to mobilize some regional and subregional co-operation efforts, especially in the sphere of human settlements and technology.

ii) *Diversification of concrete options*. This is a fundamental contribution to overcoming the restriction of options imposed by the imitative pattern. It consists basically in identifying the myriad use possibilities of each environmental element, either individually or as part of an ecosystem, as well as the resources (and research) that are necessary for their realization.

This contribution concerns specifically local planning and sectoral or corporate planning, both of which can be grouped together in the case of so-called environmental zoning or regulation plans. Sectoral planning could identify different –simultaneous and successive– use options for each segment of its area and sectoral planning could do likewise with respect to the location options for each activity which must be introduced in order to develop the segment in question.

iii) *Integrated and specific approach*. This is one of the contributions that best sums up everything that has been said; it consists basically in offering a better approach to the real variables and their material interrelationships that crystalize the complex social, technical, economic and political determinants involved.

The most suitable spheres for this type of contribution are regional planning and large-scale infrastructure works, watershed development, and metropolitan expansion projects. This is due mainly to the immediate relationship at these levels between the integrating element *par excellence*, i.e., the population –with its needs and potential– and the environmental conditions of economic and social production and reproduction.

Important regional exchange and co-operation efforts on these issues have been initiated and some of them have already reached the stage of preparing more practical management manuals.

II

HORIZONTAL CO-OPERATION ON ENVIRONMENTAL ISSUES IN LATIN AMERICA AND THE CARIBBEAN: THE CHALLENGES OF AN IDEA IN TIMES OF CRISIS

by Jaime Hurtubia*

INTRODUCTION

This paper attempts to analyse the challenges faced by horizontal co-operation on environmental issues in Latin America and the Caribbean in these times of widespread crisis in economic, financial, cultural and political affairs. Taking a critical approach, it makes an appeal for a realistic assessment of the results of the action taken to date in the region in these matters. It also seeks to show which are the main difficulties of the co-operation process and which are the deficiencies that impede the attainment of its objectives.

The paper reviews the fundamental concept of horizontal co-operation and its implementation in the environmental sphere. Particular attention is given to the gradual progress made in consolidating this co-operation between April 1983, the date of the second regional intergovernmental meeting on the environment in Latin America and the Caribbean (UNEP/ECLAC, 1983b), and April 1985, when the fourth regional intergovernmental meeting took place (UNEP/ECLAC, 1985b). Although the majority of the countries in the region have shown a sincere political will to support this co-operation, the regional environmental programmes of common interest have encountered serious obstacles to the mobilization of national and international financial contributions.

Among the main causes of the slow development of co-operation are the current deficiencies of the government agencies responsible for environmental matters, which should be the prime movers of this

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co-operation. These deficiencies are rendered more evident in the current economic and financial crisis, since the majority of the countries still do not take environmental considerations into account in decisions designed to accelerate economic recovery and growth.

Even countries in which environmental issues had with difficulty obtained a certain acceptance and legitimacy are now, as a result of the crisis, giving the topic less attention, casting doubt on the viability of the interregional horizontal co-operation scheme started in 1983.

Another constraint on co-operation is institutional heterogeneity, which renders the situation even more complex. Institutional arrangements and their consolidation are now emerging as the issues on which future co-operation activities must concentrate their attention.

This paper briefly indicates which are the problems facing Latin America and the Caribbean in horizontal co-operation in environmental matters and seeks to identify the deficiencies and structural problems which must be tackled in order to reinforce regional co-ordination and efficient application of the principles of co-operation.

A. EMERGENCE OF HORIZONTAL CO-OPERATION IN ENVIRONMENTAL MATTERS

1. The idea and concept of horizontal co-operation

The idea of horizontal co-operation was consolidated internationally in the mid-1970s as the developing countries' answer to the unfavourable international relationships which had obstructed for decades any real development of their societies. Conceptually, it is acknowledged to be a key instrument, by means of which developing countries could place themselves on a more equal footing with the rest of the world by creating, acquiring, adapting, transferring and sharing knowledge and experience with mutual advantage. The international community supported these proposals in the Buenos Aires Plan of Action, approved by the United Nations Conference on Technical Co-operation among Developing Countries, which took place in Buenos Aires from 30 August to 12 September 1978 (ECLAC, 1978). Since then the term horizontal co-operation has been applied to both technical and economic co-operation between developing countries and regions.

As a method, horizontal co-operation also implies the efficient pursuit of economic and social development. As such, it can be applied to any area in which two or more countries may have a mutual interest and show a political will to co-operate.

In the last decade the developing countries have sought to strengthen the mechanisms of understanding and mutual co-operation by moving ahead in the search for a new order of relations among themselves and with the

developed countries. Over the years the concept has been gaining ground as an important technical, economic and political factor. However, its implementation has proved difficult, both intra-regionally and interregionally. It is true that, as an idea, it was endorsed as a means of strengthening national and collective self-sufficiency, but in some cases horizontal co-operation, as a deliberate and voluntary act of sharing, pooling and exchange, has been a slow starter owing to lack of prior preparatory work by the developing countries designed to determine accurately what the possibilities were with regard to their resources, knowledge, experience and capabilities.

In short, horizontal co-operation, in order to be viable and attain significant results, requires countries to acknowledge that they have similar needs, share the same critical problems and face common challenges which require joint planning. If this recognition and common will is lacking, there can be no horizontal co-operation whatsoever. Unfortunately, the internal and external factors that influence countries to take the political decisions, first, to accept that there is a common need and, second, to allocate resources to support co-operation activities constitute obstacles to the necessary consensus that will turn the intentions and goodwill into substantial agreements.

Despite this, horizontal co-operation in Latin America and the Caribbean, as an instrument for achieving development, is very widespread and its potential is only now starting to be used. The obstacles and difficulties it is encountering are of very different sorts and include the countries' enormous heterogeneity in respect of cultural heritage, historical development, technical and institutional capabilities and financial resource potential.

During the first half of the 1980s a serious political obstacle to international co-operation arose in international forums within and outside the United Nations system: the unfortunate retreat of internationalism and multilateralism under pressure from the industrialized countries. Faced with this situation, horizontal co-operation has received a new boost and has been strengthened as a component of a strategy that opposes those interests which seek to replace multilateral co-operation with bilateral co-operation, which would facilitate the imposition of the terms of the powerful countries, to the detriment of the aspirations of the developing countries.

2. The demand for horizontal co-operation on environmental issues

Before the Stockholm Conference on the Human Environment, the countries of Latin America and the Caribbean acknowledged that, though it was important to begin a concerted global attack on environmental problems, the regional and national dimension of those problems could not be neglected. What was first stressed was that countries should undertake, within a regional

co-operation scheme, the systematic identification of the environmental problems and an assessment of their effects on development activities.

In the preparatory stage at the Stockholm Conference, governments (ECLAC, 1971) stated, as a first approach to a diagnosis, that environmental problems were a reflection of regional development and varied according to the ecological and geographical characteristics of each country and its state of development. Already in 1971 it was acknowledged that the first priority should be the incorporation of environmental considerations in development planning, and the lack of technical and scientific data for understanding environmental problems was identified as a major shortcoming.

Some specialists (Hurtubia, 1971; Hurtubia and Torres, 1972; Di Castri, 1972) stated that the problems were similar in several respects at the regional level. First there were the environmental problems in social and economic areas; second, the deterioration of ecosystems and in the management of natural resources; and third the problems caused by various forms of pollution and by demographic growth.

The advantages of intra-regional co-operation have also received attention since then within the framework of international co-operation on the environment. At the start of the so-called "ecological revolution" it was argued with abundant reason that ecosystems recognized no frontiers, and that for developing countries the problems of pollution, ecosystem deterioration, management of natural resources, conservation of the natural heritage, urban expansion, etc., were very similar. This was a reason for joint action. Furthermore, in Latin America all this was acknowledged to be fully consonant with the ideals of the much desired Latin American integration.

Di Castri, referring to the challenges to the region posed by the ecological-environmental issue, stated: "The strategy must be genuinely Latin American, acknowledging that all our nations have similar problems and that no country can face them alone, in the sincere conviction that frontiers between provinces and nations, although reflecting a historical reality, are not and must not become environmental barriers; for example, ecological recognition of the Puna would not be justified unless Bolivia, Peru, Chile and Argentina took part in it, or a study of the Chaco without the collective efforts of Argentineans, Paraguayans and Bolivians; or for that matter, a thorough investigation of the possibilities of the Amazonian ecosystems without the joint participation of all the countries of that immense watershed" (Di Castri, 1970).

In order to tackle ecological and environmental issues, some countries started to adopt environmental laws and introduced some institutional changes in the public administration so as to create bodies responsible for environmental matters. The first half of the 1970s saw the formation of a series of national committees, ministries, subsecretariats and institutes. This assortment of institutional answers was very varied and, to date, still subject to adaptation and modification.

The incorporation of environmental issues in the legal and institutional framework of some countries prompted the region to start to create agencies to commence the horizontal co-operation process. Institutional responsibilities took various forms. Only a few countries created new institutions; the majority assigned this responsibility to existing bodies in departments such as health, agriculture, science and technology, or even planning. Several countries took no action whatsoever. Since the 1970s this process has generally seen a number of successive approaches, and there has been continual change involving the revision, adaptation and modification of policies. Significant policy changes also occurred during the first half of the 1980s, resulting in the dissolution of certain environmental bodies or the transfer from one sector to another of responsibility for environmental protection and improvement.

B. THE ROAD TO CO-OPERATION THROUGH UNITED NATIONS ACTION

1. The action plans of the regional seas programmes

The first steps towards intra-regional co-operation on environmental issues were taken within the framework of a project sponsored by the United Nations Environment Programme (UNEP), which started in 1976 with the objective of formulating an action plan for environmental protection in the Greater Caribbean subregion. All island and coastal States of the Caribbean basin took part, approving in 1981 (UNEP/ECLAC, 1981) an action plan and eight priority projects, and agreeing upon joint financial support measures, including the establishment of a regional trust fund made up of voluntary contributions by the countries concerned to support the implementation of the projects. A similar experiment was made under another regional seas project sponsored by UNEP with the collaboration of the Permanent Commission for the Pacific.

In both cases UNEP, as co-ordinator, encouraged the participation of the specialized agencies of the United Nations and of other international organizations. Governments have participated directly through designated national institutions in the execution of the projects of both action plans, achieving significantly increased co-operation in the protection of the marine environment and coastal areas.

It must be pointed out that the Caribbean action plan was the first instance of environmental co-operation of a subregional intergovernmental kind, in which the governments of the area undertook direct responsibility for financing their activities and projects. The ecological and environmental importance of marine and coastal biological resources was a more than sufficient incentive for island countries to support this initiative immediately;

and the strategic and political importance of the Caribbean Sea, as well as the need to tighten their links with the English-speaking countries, determined the political will of Latin American coastal countries to participate.

2. The UNEP/ECLAC projects on horizontal co-operation and the incorporation of the environmental dimension in planning

Under the general topic of the relationship between development and environment in Latin America and the Caribbean, horizontal co-operation was given an important boost by the UNEP/ECLAC project "Development styles and environment". This project was part of an initiative sponsored by UNEP with the regional economic commissions of the whole United Nations system and designed to incorporate environmental considerations in the preparation of the Third United Nations Development Decade (UNEP, 1980).

The project ended with a seminar in November 1979 at ECLAC headquarters, the recommendations of which highlighted specifically the possibilities of the horizontal co-operation mechanism in environmental matters, recalling the goals of the Plan of Action for Technical Co-operation among Developing Countries approved at Buenos Aires a year earlier (ECLAC, 1980).

UNEP and ECLAC then agreed to carry out another project, entitled "Horizontal co-operation in Latin America with respect to development styles and environment", under which a survey was made of actions, policies, plans and other experiments in the region that were correctly oriented from the viewpoint of development-environment interrelationships. A study was made of the various activities in order to establish a horizontal co-operation network, which it was hoped would support development activities on the basis of recommendations for new strategies, policies and actions that could have positive impacts on development-environmental interrelationships.

In 1984 UNEP agreed with ECLAC to carry out a third project along the same lines entitled "Incorporation of the environmental dimension in development planning" (UNEP, 1982a), which was focused on institutional structure, intersectoral co-ordination relationships, and decision-making processes, in the light of the past experience described in the case studies examined at five national workshops.

3. CIFCA and the regional network for environmental training

At the start of international co-operation in the region environmental training was identified as one of the priority action issues. In 1975 UNEP initiated a project, with the financial co-operation of Spain, to establish an International Centre for Training and Education in Environmental Sciences (CIFCA). In the period 1975-1983 this project managed to hold and support more than a hundred training courses and seminars. The ones held in Latin America and

the Caribbean enjoyed the support and sponsorship of national governments and institutions. UNEP, in keeping with its catalytic role and after seven years' support, started to reduce its contribution to CIFCA activities from 1980.

The governments of Latin America and the Caribbean which were members of the UNEP Governing Council from its seventh session (1979) promoted the adoption of decisions to strengthen CIFCA activities. The main concern was for the prompt establishment of a regional network of environmental training institutes. For example, at Montevideo in November 1980, during the *ad-hoc* meeting of representatives of Latin America, the Caribbean and Spain on environmental education and training, it was decided to give priority to the constitution of such a network. Immediately afterwards, in 1981, under the co-operation project with CIFCA, UNEP agreed to set up a co-ordination unit for the regional network for environmental training, assigned to the Regional Office for Latin America and the Caribbean (UNEP-ORPALC) with its headquarters in Mexico City.

Since the creation of the network and its co-ordination unit several actions have been initiated to promote the participation of governments in intra-regional horizontal co-operation activities. At the same time, institutions were designated in several countries to serve as focal points of the network, the creation of national networks was encouraged and, with the help of a group of network advisers, available to all governments, priority areas of action on various issues were identified.

4. Institutional and programming difficulties

During the period 1973-1981 the governments of Latin America and the Caribbean met on one occasion only, in March 1976 at Caracas, for the fourth session of the UNEP Governing Council. Apart from that encounter, there was no further opportunity to discuss matters of regional importance concerning the environment and development. The recently created bodies responsible for environmental management in each country did not therefore have a chance to exchange experience and information concerning current environmental policies.

The desire of Latin American and Caribbean countries to contribute to intra-regional co-operation emerged as a response from governments both in the formulation of policies at the UNEP Governing Council and in the planning of activities that were being promoted by UNEP in the region. Furthermore, the distance of the region from UNEP headquarters at Nairobi made it difficult for the governments of Latin American and Caribbean countries which were members of the Governing Council to take part in it, because of the costs and time involved (Lizárraga and Hurtubia, 1983).

The Governing Council took the matter to heart, and in its decisions 7/1 (1979) and 9/1 (1981) (UNEP, 1981) sought a way for the regions to participate in its work by inviting the regional economic commissions which had not

already done so to set up intergovernmental regional committees on the environment, for the purpose of studying environmental problems from a regional viewpoint and facilitating regional co-operation.

Nevertheless, in the case of Latin America and the Caribbean, this concern was not followed up in ECLAC, which pleaded that it was already overburdened with new responsibilities such as economic co-operation among developing countries, human settlements, water, the Decade for Women, etc., without any commensurate increase of funds. For this reason ECLAC did not assume responsibility for an intergovernmental regional forum on the environment, and a widely shared concern in the region, or at least in the national agencies responsible for environmental administration, remained unsatisfied.

At any rate, the concern had been raised and, following the ninth session of the Governing Council (1981), the governments of the region expressed their interest holding a regional intergovernmental meeting before the Governing Council's special session in May-June 1982 to commemorate the tenth anniversary of the Stockholm Conference. This question, furthermore, prompted the Governing Council to include in the agenda of its tenth session the issue of the regional presence of UNEP with the aim of determining the forms in which UNEP and its programmes could acquire a more prominent and integrated regional presence, i.e., that its regional activities and institutions should have more support.

Regional intergovernmental meetings

The first regional intergovernmental meeting on the environment for Latin America and the Caribbean took place in Mexico City in March 1982. It was convened by the Mexican Government and by the UNEP Regional Office for Latin America and the Caribbean: the latter provided the secretariat. The objectives of the meeting were to formulate policy principles to guide the present and future development of environmental activities in Latin America and the Caribbean and "exchange information concerning environmental activities" so as to determine efficient forms of co-operation between countries.

This gathering also encouraged the countries of the region to adopt positions on matters to be dealt with at the special session. Indeed, the Executive Director of UNEP, in his opening statement, said that he viewed with interest the "establishment of a common front" and suggested "seeking continuity of these regional intergovernmental meetings in every way", so as to "establish a common and developing position with regard to the environment".

ORPALC/UNEP, in its capacity as secretariat and in accordance with governments' instructions, included in the meeting's documents the first materials for the formulation of regional and subregional programmes as a

means of putting into operation efficient mechanisms for intra-regional horizontal co-operation and "enriching the exchange of national experience with a view to joint approval of concrete action measures suited to common sociocultural and ecological plans" (UNEP/ECLAC, 1982).[1]

Latin America and the Caribbean took part in the special session, and in the tenth council session immediately thereafter, as the only developing region which had a common position on the next decade of UNEP, on regional participation and on ways of strengthening regional co-operation on the environment. The recommendations of the first regional intergovernmental meeting were fully supported by the tenth council in decision 10/2 on regional participation of the United Nations Environment Programme and decision 10/3 on regional programmes of Latin America and the Caribbean (UNEP, 1982 b).[2] These decisions formally established the regional intergovernmental meetings, and it was suggested that prior to these meetings these should be meetings "of experts appointed by governments to review technical matters pertaining to regional environmental programmes".

In March 1983 the expert meeting and the second regional intergovernmental meeting were held at Buenos Aires, Argentina. ORPALC/UNEP, as secretariat, presented three working documents: Strategy for regional environmental programmes; bases for regional environmental programmes; and the guidelines for the formulation of such programmes. These documents were approved by the second intergovernmental meeting, which stressed that "every positive and beneficial results could be obtained for all countries in the region if horizontal co-operation on environmental issues was regularly strengthened"; furthermore, it stated that "regional co-operation would boost the potential of the countries concerned and support the national effort, for which there was no substitute" (UNEP/ECLAC, 1983a). The regional and subregional programmes that the governments determined to be of common interest were:

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[1] Decision 2 established the bases of future intra-regional horizontal co-operation by ackowledging that "regional and subregional approaches are the most suitable for tackling environmental problems in Latin America and the Caribbean, owing to the common ecological, cultural and socioeconomic frameworks, which facilitate the solution of similar or shared problems by multiplied strength", and recommended that "the aims of future intra-regional co-operation on environmental issues should include the strengthening of existing integration mechanisms and the approval of specific co-operation agreements on the environment".

[2] See also decisions 10/4 on environment and development and 10/26 on additional resources for tackling the serious environmental problems of developing countries. Decision 10/26 promoted the creation of a clearing house in UNEP to apportion financial resources from donor countries to developing countries, in support of the incorporation of environmental considerations in development programmes and projects.

a) *Regional programmes*

PR-3: Development and environmental planning;
PR-5: Development of legislation and institutional environmental frameworks;
PR-6: Environmental education;
PR-7: Information systems to support environmental management;
PR-9: Environmental regulation for rational exploitation, protection and rehabilitation of fresh-water ecosystems (inland waters);
PR-10: Protection and conservation of cultural and natural heritage and protected areas.

b) *Subregional programmes*

PSR-6: Natural potential and rational regulation of tropical and subtropical forest ecosystems.

The second regional intergovernmental meeting endorsed the recommendations of the expert meeting and adopted, in response to decision 10/26 of the Governing Council, a specific decision on technical co-operation among developing countries. In the spirit of these decisions, the Government of Argentina announced a contribution of US$1 million over a period of five years, as additional resources for the UNEP Fund, to promote intra-regional and interregional horizontal co-operation on the environment (UNEP/ECLAC, 1983 b).

However, despite the headway made at this second regional intergovernmental meeting, its report and decisions were not very enthusiastically received at the eleventh session of the Governing Council, since implementation of the proposals would mean diverting the limited resources of the UNEP Fund, which until then had been allocated to other activities. Consequently, the view that the implementation of regional co-operation programmes had to be funded from other sources prevailed, with the understanding that such funds should come largely from the countries directly concerned.

5. Some effects of the crisis

The countries of the region came to Lima for the third regional intergovernmental meeting (April, 1984) in an atmosphere fraught with pessimism and the pressures of an economic and financial crisis which was making itself felt mostly severely at the national and particularly in the environmental agencies. A crisis then developed as a result of the steady weakening of the national environmental agencies and their programmes and activities. For this reason the meeting made no significant progress towards the implementation of regional programmes, for the necessary financial resources, either national or international, were not available.

Because of this lack of funds which impeded the true launching of co-operation, the fourth regional intergovernmental meeting on the environment in Latin America and the Caribbean, held at Cancún in April 1985, was devoted almost exclusively to possible methods of funding, such as the mobilization of the own resources of the countries of the region, in national currency and contributions in kind, with a view to an early start on the implementation of regional programmes of common interest.

In short, since 1983 the lack of foreign exchange and the reduction of international contributions in support of environmental activities created a difficult situation, one which not only affected the start-up of regional programmes of common interest but also limited the development of other regional and subregional environmental activities of importance for intergovernmental co-operation. For example, the scarcity of funds has affected in recent years the development of the Caribbean Action Plan, which has not to date set up its co-ordination unit or reached the required level of contributions to the regional trust fund. The same thing happened to the Action Plan for the South-East Pacific.

Perhaps the most graphic example of this decline was the case of the International Centre for Training and Education in Environmental Sciences (CIFCA). CIFCA activities were seriously affected in 1983 by the decrease of financial contributions from UNEP almost to zero. The Spanish Government requested, before the cessation of contributions from UNEP, that the governments of Latin America and the Caribbean should make financial contributions to keep CIFCA functioning. When it ascertained that it could not count on the requested contributions from these governments, the CIFCA Board (on which the governments of the region were represented), resolved on its dissolution at the start of 1984. In this manner, the first attempt to seek a financial commitment from all the governments of the region to a common environmental cause turned out to be the first failure to consolidate intra-regional horizontal co-operation on an issue having a priority acknowledged by all the region's governments and the UNEP Governing Council.

Nevertheless, it can be said that the shortage of funds was not the only cause of the weakening and stagnation of co-operation. The dissolution of CIFCA was also largely due to the incapacity of national environmental agencies in Latin America and the Caribbean to play a more influential role in the centres of government where decisions are taken, and to prevent environmental issues from being regarded, from 1983 as matters of no priority which could be postponed in times of crisis.

Therefore, it can be concluded that intergovernmental regional co-operation on environmental matters in Latin America and the Caribbean in the period 1982-1985 had the following characteristics:

– difficulties in mobilizing international financial resources in support of the execution of regional programmes of common interest;

– difficulties on the part of governments in meeting financial commitments needed for participation in the programmes;

– problems of national agencies responsible for environmental administration in strengthening their budgets and extending their activities; and,

– in general, the pressures to postpone environmental issues and multilateral international co-operation owing to the prevailing economic and financial crisis in the region.

It must be added that, despite the considerable experience acquired in 1982-1985, historically it is too brief a period for any conclusions to be drawn in respect of such a complex process as intergovernmental regional co-operation. What can be seen now, since the fourth regional intergovernmental meeting at Cancún (April 1985) is that, despite these difficulties, the governments represented at those forums by environmental agencies (which directly bear the negative effects of lack of support and of both national and international funds) have carried on supporting intra-regional horizontal co-operation, which is viewed as a valuable mechanism for acquiring and sharing mutually advantageous knowledge and experience which, little by little is helping to strengthen them.

Following the Cancún meeting, the trend towards stagnation in regional co-operation on environmental matters has taken an interesting qualitative turn. It has been agreed that co-operation efforts should be continued, with the governments themselves taking part in the preparation of projects to implement programmes of common interest, contributing in kind with their established facilities and specialists, and funding with local currency projects of national and regional interest. Nonetheless, this does not mean that successful utilization of local currencies will ensure the total implementation of regional co-operation plans, since the main obstacle, as will be seen below, remains a political one in the countries themselves, where environmental agencies still have not found a suitable place in public administrations. This is the major challenge for the future: to give due priority to the environment and strengthen the weak environmental institutions that must be the agents of horizontal co-operation.

At its thirteenth session the UNEP Governing Council took these decisions into account and adopted a series of measures aimed at supporting the development of local-currency resources and contributions in kind. During the second half of 1985 UNEP approved three projects financed mainly by the UNEP Fund,[3] which it is hoped will help to promote the formulation of subprojects that may be financed mainly in national currencies and by contributions in kind. Each of these projects will be formulated according to

[3] PR-5: Development of legislation and environmental institutions; PR-10: Protection and conservation of natural and cultural heritage and protected areas; and PSR-6: Natural potential and rational exploitation of tropical and subtropical forest ecosystems..

the conceptual framework and aims of the joint regional programme approved by all the governments. Each subproject will have a multiplier and demonstrative effect, at both national and regional levels. Each one will be agreed bilaterally: by UNEP and by the agency of the country concerned, and at a later stage it will be included as a subproject of the UNEP-financed integrated promotor project.

It can be argued that, with regard to financial matters, the future of regional co-operation on environmental issues depends on the gradual incorporation of the various countries of the region in this financial plan designed to fund programmes of common interest with national currencies. There is no reason to think that countries will not become active participants in the implementation of the various subprojects, with the technical support and hard currency coming from integrated projects supported by UNEP and other sources.

If this formula is unsuccessful, it will be difficult to prevent the collapse of the countries' interest in a co-operation plan. The proposed plan for UNEP/Agency integrated projects and the creation and promotion of UNEP/Government subprojects financed in national currency would seem to offer a clear opportunity in this respect.

Essentially, the future of the co-operation plan described here will depend on the degree of participation that can be obtained from governments in implementing regional environmental programmes of common interest with UNEP/Agency support, in overcoming the present institutional limitations at the national level, and in mobilizing national currencies and contributions in kind that will prompt contributions from international sources.

C. INTERNAL DEFICIENCIES OF THE REGION WITH RESPECT TO CO-OPERATION

In addition to the financial problems outlined in the previous chapter, there are other deficiencies in the region which have so far prevented the installation of a solid co-operation machinery.

1. Participation in intergovernmental meetings

Since the first meeting the number of countries participating in each intergovernmental regional meeting has diminished appreciably. In the meetings held so far there is quite a high percentage (45.45%) that has taken part in one or no meeting and only 24.24% that has participated in all meetings. Moreover, it is important to emphasize the level of representation. At the third meeting in Lima only two representatives at ministry level took part, plus the technicians; six (37.5%) of the 16 participating countries were represented by officials of the embassies in the host country. Obviously it is difficult, if not impossible, to draw up and implement a co-operation plan in

the absence of solid support from the countries concerned and officials from their own environmental institutions.

Is it that the countries' environmental administrations have given up the co-operation plan? We think not. What has happened is that this co-operation continues to receive unquestioned support, but it has weakened in practice, as a reflection of the significance of environment in each country, where it did not manage to play a protagonistic role in national affairs before the crisis. In addition there are the policies adopted by other governmental agencies which, under pressure of the crisis, relegated environmental matters to a secondary plane. Today, a concern common to all environmental administrations is the effects of the crisis at the higher levels where decisions on the environment and development are made.

The latest events in various countries seem to demonstrate that the environmental institutions themselves are at stake and under pressure because they were not strong enough to take on a protagonistic role in national policies before the crisis. The eagerly sought solution in environmental circles is to prove that ecological-environmental concepts, techniques and knowledge can be vital to efficient economic recovery and sustained development.

2. Institutional heterogeneity

Another deficiency that has to be taken into account is the heterogeneity of the national institutions responsible for environmental matters in the region and of the sectors to which they belong. This structural and sectoral diversity also seems to be limiting the implementation of the very principles of co-operation by impeding the identification of a common interest in the division and sharing of resources and the exchange of data and experience between partner institutions with varying structures and locations within the public administration (status, competence, links with planning, relationships with other subdivisions, management resources, etc.). As evidence of this heterogeneity table 1 lists the institutions responsible for national environmental administration in Latin America and the Caribbean.

3. New environmental institutions

As table 1 shows, only 10 countries of the region have established environmental organizations as such with responsibility for the application of a global environmental policy. National structures are very clear in this respect, for together with a great heterogeneity they also show the degree of ineffectiveness, at the national level, of the assignment of environmental responsibilities. Countries which, in addition to an environmental institution, have established co-ordination bodies such as interministerial councils or commissions can count on the participation of almost all sectors. Experience

Table 1

DISTRIBUTION OF ENVIRONMENTAL BODIES (UNEP TECHNICAL FOCAL POINTS) IN PUBLIC ADMINISTRATIONS IN COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN

COUNTRIES	PUBLIC ADMINISTRATION					
	Environmental entities		Other bodies			
	M/Subsec	Syst/C	T	P	A/NR	H
Aruba and Antigua	-	-	x	-	-	-
Argentina	x	-	-	-	-	-
Bahamas	-	-	-	-	-	x
Barbados	-	-	x	-	-	-
Belize	-	-	-	-	-	-
Bolivia	-	-	-	x	-	-
Brazil	x	-	-	-	-	-
Colombia	-	-	-	-	x	-
Costa Rica	-	x	-	-	-	-
Cuba	-	x	-	-	-	-
Chile	-	x	-	-	-	-
Dominica	-	-	-	-	x	-
Ecuador	-	-	-	x	-	-
El Salvador	-	-	-	x	-	-
Grenada	-	-	-	-	-	x
Guatemala	-	x	-	-	-	-
Guyana	x	-	-	-	-	-
Haiti	-	-	-	x	-	-
Honduras	-	-	-	x	-	-
Jamaica	-	-	-	-	x	-
Mexico	x	-	-	-	-	-
Nicaragua	-	-	-	-	x	-
Panama	-	x	-	-	-	-
Paraguay	-	-	-	-	x	-
Peru	-	-	-	x	-	-
Dominican Republic	-	-	-	-	x	-
Saint Kitts and Nevis	-	-	-	-	-	-
Saint Lucia	-	-	-	-	-	x
Saint Vincent and the Grenadines	-	-	-	x	-	-
Suriname	-	-	-	-	-	-
Trinidad and Tobago	-	-	-	x	-	-
Uruguay	-	-	-	x	-	-
Venezuela	x	-	-	-	-	-

M/Subsec = Ministry/Subsecretariat
Syst/C = National system or commission for environment or ecology
T = Tourism
P = Planning
A/NR = Agriculture and natural resources
H = Health

shows that the assignment of responsibilities between national and sectoral organizations is far advanced in these countries. In the majority of them, the execution of many programmes and policies of environmental control –use of land and water, sanitation and waste removal– is a local-government responsibility. In federative countries the responsibilities are usually distributed between the federal government and the governments of the states concerned. Consequently, although "horizontal" co-ordination at national or State levels implies in many cases hundreds of relationships, "vertical" distribution can raise the number of relationships to several million. Therefore, numerous entities may be created with responsibility for the co-ordination of these relationships at different levels.

When new environmental institutions have not been created, the deficiencies appear to be greater (see table 1), as the responsibilities have been assigned to administrative institutions already in existence, such as planning (9) or sectors such as agriculture and natural resources (6), health (3) and tourism (2). In the great majority of countries the environmental office in each of these "sectors" or "institutions" has no regulatory or political power and limited staff.

Furthermore, the lack of national mechanisms for efficient intersectoral co-ordination constitutes a real bottleneck. Several of the agencies instituted had little political power and have tended to fade away over time, although recently two governments have created national ecology commissions, raising the hope that environmental policies may yet be strengthened within the governmental apparatus (UNEP/ECLAC, 1985a).

It is indispensable to continue to promote the strengthening of national mechanisms for intersectoral co-ordination for environmental regulation. There are no magical formulas for achieving effective co-ordination; for this reason it constitutes a priority area of study, so that it can serve as a horizontal co-operation plan to be implemented in the different public-administration structures in the region. The efficiency of these co-ordination mechanisms will determine managerial success and the effectiveness of environmental law.

3.1 *The administrative hierarchy*

Another important question which should be considered is the position in the administrative hierarchy of each of the new environmental bodies. It may be concluded that in most cases their status is not very significant, for they are not found at cabinet level and are not responsible to the chief executive; many are not responsible either to ministerial co-ordination bodies and have neither executive nor regulatory functions but only advisory ones. The efficiency with which they carry out their work is also worrying, for in many cases they duplicate the work of other sectors such as health (sanitation, environmental hygiene), agriculture and forestry (resources, forestry, land,

desertification, protected areas and wildlife), etc., creating sterile and needless conflicts of competence.

Another consideration is the links between environmental institutions and development planning: whether they are really effective or only apparently so, and whether working relations extend as far as projects or embrace strategic subjects such as the country's territorial development, regional planning or land-use planning. It is clear that with regard to planning, as in the case of the environment there is little ground for optimism either, for in a fair number of countries of the region, although planning as an exercise is commended and planning ministries or offices have existed for a long time, the resulting plans are often idealistic statements of good intentions, given the realities of the financial crisis, the generalized State crisis, and the power of national and transnational private sectors.

The experience of other regions shows that, if this function is to be fully carried out, the co-ordinating body must have sufficient political power to apply a policy adopted at the highest level by the legislative and executive authorities and must have a strong budget to enable it to implement working agreements in concert with the different sectors concerned with environmental regulation.

4. Human resources

All these institutional limitations are also intimately connected with the shortage of qualified high-level technical staff in the public administration. It should be remembered in this connection that environmental management, especially when it is connected with project preparation or national development planning, requires abundant funds for different types of specialized staff and equipment and installations for the observation and evaluation of the environment, for research and for pollution measurement. On several occasions countries have stressed the scarcity of human resources as a major deficiency and the negative implications of this scarcity for the implementation of plans for co-ordinated environmental management.

All these considerations prompt us to point out that the projects carried out so far, because they did not acknowledge the institutional deficiencies and the shortages of specialized technical resources and equipment, have concentrated only on scientific or conceptual results. Also enthusiastic consideration has been given to the possibility that, in the light of the findings of each project, there should be an exchange of experience, knowledge and information, disregarding the fact that many of the countries which would be involved in this co-operation have such severe institutional and staff limitations that the effects of any co-operation exercise would gradually fade away over time. This has already happened in the past.

5. Discussion

The deficiencies described above will continue to have negative effects on any attempt at co-operation between the countries of the region; and internal difficulties will persist both in efforts to establish good lines of communication between sectors, particularly industrial planning and regional development, and in efforts to improve the decision-making process.

The analysis of the experience of horizontal co-operation in environmental matters in Latin America and the Caribbean offered in this paper has been particularly useful in highlighting a series of issues. They include: concern for the environment has not taken strong enough root in the governments of the region; in most of the countries governmental institutions responsible for the environment consist of bodies within the public administration which are still in the process of consolidation; there is little knowledge and limited experience of environmental management available from governmental institutions; and furthermore, many circles of political and financial power within the governments still do not recognize the value and importance of incorporating the environmental dimension in the planning of economic and social development.

At present, in most countries the environmental institutions are the most recently established in the public administration; they are not yet fully accepted, have limited budgets, and are vulnerable to the strongest repercussions of any crisis because they are the weakest links in the administrative structure. They have not yet become essential agents of the regional co-operation so greatly needed today. Because of this, it is necessary to concentrate all available resources, both in the international community and in regions and countries, in order to strengthen them.

Moreover, because of these deficiencies the capacity of the countries to respond to the exacting and complex demands of the enforcement of a national environmental policy has not been developed to the required degree. On many occasions, for lack of a real "environment authority", the subject of and the responsibility for "environmental effects of development activities and projects" have been converted into a no-man's-land, giving rise to sterile conflicts of interest between different sectors. In the 1970s, faced with this inability to effect adequate management, it was held that no attention could be paid to environmental matters "because it halted or impeded development". Now in the mid-1980s, faced with the same reality, it is held that "neither efforts nor resources can be withheld from the reactivation demanded by the crisis". But basically the same problem still exists.

The reasons for these attitudes seem to be due, in some cases, to the inability to confront the challenges of environmental problems and, in others, to a patent indifference in decision-making circles, where the short term is still favoured because of the pressing burden of socioeconomic and political problems. The other side of the coin is that those who have been insisting on

the global importance of environmental problems and their full integration in development planning have not been able to get even the most elementary environmental message through to high political circles, to the production sectors, and especially to the executive departments where decision-making on development issues is concentrated. The same can be said of the efficiency with which this environmental message has been assimilated by the public, the working community and workforce, the trade unions, and the mass communications media. In many cases since the 1970s, specialists in environmental problems have committed the sins of technocracy and élitism in their activities.

Regarding activities which should be promoted in the future in an operational plan to support regional co-operation, there are four problems on which future action should be concentrated: a) shortage of financial resources; b) institutional deficiencies; c) the organizational heterogeneity of environmental institutions in the public administration; and d) training of human resources. "Environmentalists" have committed the opposite sin; their arguments concentrate on the dangers of the long term, and therefore the benefits accruing from minimizing such dangers lie far in the future, in a continent overwhelmed by the immediate situation. Their mistake is to offer an ineffective criticism of the tendency to favour the short term, actually forgetting that the long term depends on the solution of short-term problems. Here there have been too few proposals to mobilize resources today in accordance with viable plans, thus shifting the emphasis of the environmental message from future problems and the identification of deficiencies the search for sound answers to current problems on solid environmental bases. All these problems can be overcome if a genuine political purpose exists at the national level to strengthen environmental activities and surmount the obstacles stemming from the present crisis. Other papers in this book have already dealt in sufficient detail with the substantive issues which demonstrate the importance of incorporating the environmental dimension in the development process, so that there is no need to labour the point here.

Apparently, a decisive step that should be taken at present is to put into practice sufficiently realistic proposals for the speedy implementation of the regional environmental programmes of common interest approved at the second regional intergovernmental meeting at Buenos Aires, making maximum use of mechanisms of horizontal co-operation. The political moment must not be lost through further postponement of the implementation of this regional co-operation plan. Execution of these proposals should also start as soon as possible, with the participation of governments that have a sufficiently strong environmental administration in certain areas to enable them to offer assistance to other countries in the region. This would set the process moving, which is the main thing. Later, in the course of its development, which should be widespread and open to all countries of the region, gradual steps should be taken to facilitate the

participation of the remainder of the countries. The fundamental aim of this move would be to overcome the four problems mentioned in the previous paragraph. And this will only be possible if the implementation of activities begins soon, with the limited resources available in UNEP from international sources, and in the countries themselves in the shape of contributions in national currency and in kind.

D. BY WAY OF CONCLUSION

Horizontal co-operation is a dynamic convergence of the wills and concrete actions of countries to overcome obstacles of economic and social development, and it demands as a foundation a deep conviction of the importance, value and urgency of the subject-matter of the proposed co-operation.

In view of the structural and temporary problems of the present economic and financial crisis in the region, the omens are extremely serious. The options are clear: either environmental considerations are incorporated in planning as soon as possible, in the midst of the crisis, in order to ensure sustained long-term development while searching for the solution to the most urgent problems (job creation, improvement of sanitation conditions, etc.), or we shall continue the trial-and-error floundering witnessed thus far, which will only lead to the closure of options for the development and welfare of future generations.

In these times of crisis the idea of horizontal co-operation represents a new conception of the shared use of limited resources and experience. This co-operation should be assigned the fundamental role of uniting wills in a common objective, for the promotion and attainment of this objective requires the will, united effort and co-ordination rather than resources.

Some suggestions for action are made below; if full advantage is taken of the resources and institutions which the governments of the region already have and those available in UNDP, ORPALC/UNEP and ECLAC, in regional governmental bodies and in the UNEP loan facility, such actions could help considerably to put horizontal co-operation into practice in environmental affairs, thereby contributing substantially to the incorporation of the environmental dimension in development planning.

1. Horizontal co-operation in environmental affairs in Latin America and the Caribbean must be a sphere of transectoral action within the guidelines for technical and economic co-operation already in use between developing countries. It should also become part of the intra-regional co-operation policy promoted by the four regional intergovernmental meetings on environment in Latin America and the Caribbean held between 1982 and 1985; and it should be conceived in the terms determined earlier for technical and economic co-operation among developing countries, i.e., to

enable the countries of the region "to create, acquire, adapt, transfer and share knowledge and experience for their mutual benefit and to secure national and regional self-sufficiency" (ECLAC, 1978).

2. If horizontal co-operation in environmental affairs is to be a dynamic and efficient process of convergence and have some prospect of significant implementation in the region, it is necessary:

a) For governments to show genuine political will which confirms their determination and desire to co-operate, share, associate and exchange technical resources, knowledge and experience in the sphere of the environment, in order to achieve sustained economic and social development in the long term. The initiation of horizontal co-operation depends, in the end, on the will of the countries to increase their capacity for concerted action;

b) For co-operation to be initiated and organized primarily by the governments of the region, but with the participation of bodies of the United Nations system, regional and subregional bodies and public and academic institutions, as well as of subgovernmental bodies and private organizations;

c) For governments to determine their needs and capabilities in environmental and development matters, as it is up to them to be the essential agents of horizontal co-operation and show that they are willing to work by seeking joint answers, tracing converging paths, and endeavouring to carry out programmes of common interest;

d) For the participation of intergovernmental, regional and subregional organizations and of specialized agencies of the United Nations system to be accelerated –something which has proved difficult up to now;

e) For the United Nations Development Programme (UNDP) and the regional intergovernmental agencies to be involved in future projects and activities of horizontal co-operation in environmental matters with a view to development;

f) For the private sector and international financing agencies to be involved in future projects and activities of non-governmental organizations;

g) For horizontal co-operation to maintain and increase its activities through a regional mechanism that helps to perform the functions of co-ordination, intermediation, promotion and catalyst, and mobilize[4] resources to strengthen national institutions and the mechanisms of intersectoral co-ordination, so that they may become effective co-operation agents.

3. For the period 1986-1987 and from then on, it is suggested that UNDP, UNEP and ECLAC devise, promote and support projects and activities for horizontal co-operation in environmental matters, in the implementation of which both the central planning bodies and the institutions responsible for environmental administration should participate. Such projects should aim at

[4] In co-ordination with the loan facility at UNEP headquarters.

providing innovative answers to the countries' needs, offering a solid substantive base for study and research on the principal processes that link mutually advantageous relations between development and environment in Latin America and the Caribbean.[5]

4. Future horizontal co-operation projects for the implementation of every regional environmental programme of common interest should promote the mobilization both of national-currency resources and contributions in kind in participating countries and foreign-currency resources from international bodies and other sources of international finance.

5. To ensure efficient development of environmental co-operation activities, a regional mechanism should be established by means of a project supported by UNDP, UNEP and ECLAC (see table 2).

6. The main purpose of this regional mechanism would be to maintain permanent and close collaboration with the special horizontal co-operation agencies of governments and to stimulate collaborative activities in environmental programmes of common interest, with the participation of central planning bodies and environmental bodies.

7. Another purpose of this regional mechanism would be to mobilize support from subregional and regional intergovernmental organs and those of the United Nations system, as well as non-governmental and private sector organizations in the co-operative activities of the governments, so that these links and collaboration would establish formal and informal communication networks between these various actual or potential agents of horizontal co-operatión in environmental matters.

8. The specific objectives of the regional mechanism would be *inter alia*:

a) To accelerate the start-up of regional environmental programmes of common interest approved at regional intergovernmental meetings on the environment in Latin America and the Caribbean;

b) To identify countries or groups of countries with which it would be possible to collaborate in horizontal co-operation activities in areas of common interest;

c) To identify technical co-operation capacities and needs in the region with respect to environment and development;

d) To collaborate with governments, at their request, to stimulate and promote the utilization of these capacities;

e) To devise methodologies and criteria for the formulation of horizontal co-operation projects;

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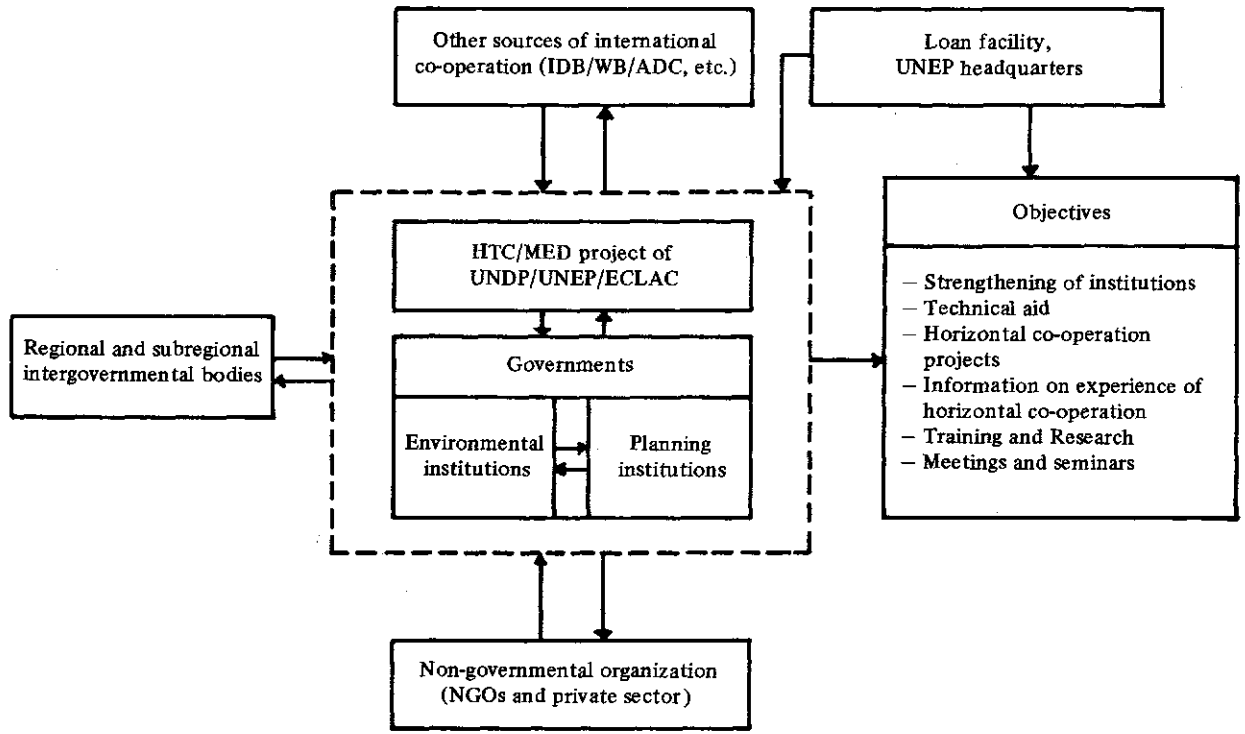
[5] Overdevelopment, marginalization and living conditions in large cities; advance of the agricultural frontier and development of the hinterland in Latin America and the Caribbean; decline in que quality of shared international resources; expansion of technical processes and their relationship with energy sources; impoverishment of diet, potential of ecosystems, and decline in health standards.

Table 2

PROPOSED REGIONAL MECHANISM FOR THE IMPLEMENTATION OF HORIZONTAL TECHNICAL CO-OPERATION ACTIVITIES (HTC) IN MATTERS OF ENVIRONMENT AND DEVELOPMENT (MED)



f) To advise countries in the explicit formulation of policies of horizontal environmental co-operation integrated in their own programmes, plans, strategies and objectives for development and the environment;

g) To co-operate with governments in the identification of specific shared situations and problems and common interests through subregional groups in certain geographical areas of the region, with the object of consolidating or initiating modalities of co-operation in environmental matters within the groups of countries concerned;

h) To support countries and subregional and regional intergovernmental organizations in the preparation of co-operation studies and projects;

i) To compile and disseminate information on horizontal co-operation activities in environmental matters in the region;

j) To promote and organize national and regional meetings on specific topics, in which the special horizontal co-operation units of central planning bodies and environmental bodies exchange experience and knowledge or programme co-operation activities of mutual interest; and

k) To perform the functions of catalyst and mobilizer of financial resources for horizontal co-operation activities.

BIBLIOGRAPHY

Di Castri, F. (1970): "La revolución ecológica y América Latina: situación presente y estrategias de acción", *Ciencia americana*, vol. 11, Nos. 3-6, Washington, D.C., Organization of American States (OAS), May-December.

____ (1972): "Problemas ambientales en los países en desarrollo: objetivos y estrategias", *NFR Bulletin*, No. 1, Swedish NCR.

ECLAC (Economic Commission for Latin America) (1971): *Report of the Latin American Regional Seminar on Problems of the Human Environment and Development* (ST/ECLA /Conf.40/Rev.1), October.

____ (1978): "Buenos Aires Plan of Action for Promoting and Implementing Technical Co-operation Among Developing Countries", *Report of the United Nations Conference on Technical Co-operation Among Developing Countries* (A/Conf.79/13/Rev.1), August-September.

____ (1980): *Report of the Seminar on Styles of Development and Environment in Latin America* (CEPAL/PROY.2/G.1), January.

Hurtubia, J. (1971): "Problems related with natural resources management", *Major Environmental Problems of the Human Environment*, Washington University, Saint Louis, Missouri, United States of America.

Hurtubia, J. and S. Torres (1971): *Ecological and Economic Aspects for the Latin American Development*, 138th Annual Meeting of the AAAS, Philadelphia, Penn., United States of America, December.

Lizárraga, J. and J. Hurtubia (eds.) (1983): *Los asuntos ambientales en América Latina y el Caribe durante el decenio 1972-1982. Diez años después de Estocolmo*, various authors, Madrid, Centro Internacional de Formación en Ciencias Ambientales.

UNEP (United Nations Environment Programme) (1980): *Choosing the Options: Alternatives, Lifestyles and Development Patterns*, UNEP Executive Series, No. 2, Nairobi, UNEP Publications.

_____ (1981): *Report of the Governing Council on the Work of its Ninth Session* (UNEP/GC.9/15), Annex 1: "Decisions adopted", Nairobi, May.

_____ (1982a), *Incorporating the Environmental Dimension in Latin American Development Planning Processes: Methodological Aspects, Case Studies and Horizontal Co-operation* (Project FP/2102-82-05(2397)), May.

_____ (1982b): *Report of the Governing Council on the Work of its Tenth Session* (UNEP/GC.10/14), Nairobi, 15 June.

_____ (1981): *Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme* (UNEP/IG.27/3), Montego Bay, Jamaica, April.

_____ (1982): *Final Report of the Intergovernmental Regional Meeting on the Environment in Latin America and the Caribbean* (UNEP/IG.33/5), Annex V: "Resolutions and recommendations", Mexico City, March.

_____ (1983a): *Final Report of the Meeting of Government-nominated Experts on Regional Environmental Programmes in Latin America and the Caribbean* (UNEP/IG.40/6), Buenos Aires, March.

_____ (1983b), *Intergovernmental Regional Meeting on the Environment in Latin America and the Caribbean* (UNEP/IG.40/7), Annex V, Buenos Aires, March.

_____ (1985a): *Contributions for Assessing Environmental Matters in Latin America and the Caribbean: Trends, Approaches and Prospects up to the Year 2000* (UNEP/IG.57/3).

_____ (1985b): *Fourth Intergovernmental Regional Meeting on the Environment in Latin America and the Caribbean* (UNEP/IG.57/6), Cancún, Mexico, April.

CONCLUSIONS

Foreword

These conclusions correspond to those of the report on the regional seminar on "The environmental dimension in development planning", held at Buenos Aires from 17 to 19 June 1985. This seminar was the culmination of the ECLAC/UNEP project mentioned in the introduction: "Incorporation of the environmental dimension in development planning: Methodologies, case studies and horizontal co-operation".

On the basis of the specific conclusions of the project's various theoretical documents (described in this volume) and of the case studies (published in volume II), the seminar was organized around the topics presented in this chapter.

1. The analysis of the incorporation of the environmental dimension in development planning must necessarily be made in the context of the region's current crisis.

2. In this context the authorities are acting on the actual situation, using basically the instruments of political economy with an *ad hoc* focus. The main features of policy appear to be significantly influenced by external pressures in the heavily indebted countries. In spite of the recessionary adjustment measures, it is possible to predict growing pressure on natural resources and the environment. This pressure may increase when the recessionary adjustment to the crisis gives way to the necessary expansionary adjustment and the transition to development.

3. The environmental concern in its conventional shape, has been almost completely banished as a public priority in most of the countries of the region. It is therefore a matter of urgency to secure a change both in the debate and in the substantive proposals on environmental problems, in order to replace the traditional "reactive" conservationist attitude with a "purposeful" proposal for the efficient and durable mobilization of the natural resource base and the environment. Only an approach of this kind can at the same time restore a relevant position for policies and measures of environmental protection and improvement.

4. It is a question, then, of tackling the crisis by combining a policy of selective demand restriction with a policy of selective supply expansion, taking advantage of idle productive assets on bases sustainable in the long term.

5. The challenge facing the region, from an environmental point of view, is to combine policies and measures to tackle the crisis in the short term by means of development planning that generates a more rational style and in particular a more intelligent, equitable and sustainable exploitation of the environment.

6. This challenge means tackling the following problems, amongst others:

a) The crisis of traditional planning schemes, by overcoming the rigidity of the techno-bureaucratic style which generates "book plans", at the level of global, sectoral and regional planning;

b) The technological dependence and the vulnerability that this brings to Latin American societies makes it urgent to reinforce scientific and technological development, in order to furnish techniques suited to our social, cultural and environmental situation;

c) The limitations of traditional methods of research and evaluation of natural resources and the environment; this means correcting the lack of dynamic analysis, the lack of systematic focuses and the bias of the analyses that assign priority to only one or two resources;

d) The failure to elaborate and use instruments, principally quantitative ones, such as environmental impact assessment and establishment of inventories and balances of the natural and cultural heritage; this means developing such instruments in order to complement the analytical methodologies of cost-benefit studies and the systems of national and regional accounts;

e) The lack of response from the environmental institutions that have been created in imitation of the models of central countries; this suggests that these institutions should be adapted to cope with the concrete situations faced by every country and with the corresponding administrative traditions; and

f) The lack of dynamism in intra-regional horizontal co-operation activities in environmental matters; this means seeking the resources that make such co-operation possible –above all, the political will, a concertated approach and co-ordination of efforts to this end.

7. The seminar analysed each of these problems in depth. There now follows a summary of the principal conclusions that may be drawn from the discussions.

A. THE ENVIRONMENTAL DIMENSION AND PLANNING LEVELS

8. It is recognized that there is a serious crisis of formal planning in Latin America, partly due to the inefficiency of the traditional schemes, methodologies and instruments but aggravated in some countries by the neoliberal monetary experiments of recent years.

The ineffectiveness of the latter methods when faced with the twists and turns of the economic crisis and the difficulties confronting the countries that did not abandon the tradition of State direction and planning has led, in the first case, to a tendency to advocate the role of planning in development processes and, in both cases, to emphasis on the urgent need to conceive and design more dynamic, adaptable and efficient planning schemes and methodologies.

9. Within this context, the idea of incorporating the environmental dimension in planning, which had been gaining ground since the mid-1970s, is faced, on the one hand, by the difficulty of identifying a relevant role in a whole problematical situation centered principally on the short term and, on the other hand, by an opportunity to exercise significant influence in the conceptual and design efforts, not only with respect to strictly methodological problems but also in everything relating to the design and proposal of alternative development styles.

10. There are three central elements to the environmental arguments: first, the absolute necessity to influence the demand level and structure in countries, for this in the end exerts heavy pressures on the available resource base; secondly, the need for progress in the establishment of systematic forms of management of the natural resource base and the environment which take explicit account of the complexity of environmental systems, and their heterogeneity and variability, in order to ensure that they are sustainable in the long term; and thirdly, deriving from the first two needs, the introduction of the planned development of the country's territory as a fundamental factor in planning activity. These three elements permeate development planning at the various levels: global, sectoral and regional.

11. The incorporation of the environmental dimension in global plans as an additional chapter has had, to date, practically no impact on development policies, programmes and projects.

12. At this level, and without seeking to explain strictly environmental problems (see the conclusions on institutional and legal aspects), the incorporation of the environmental dimension should be effected mainly in the light of considerations as to:

– the sustainability of development strategies, with greater coherence between the short term and the medium and long term;

– trends in the level and structure of consumption of the national population, with greater and better correspondence between real shortages and supplies;

– the mobilization and utilization of own resources on bases sustainable in the long term by means of global policies (for prices, taxes, public investment, duties, tariffs, etc.).

13. As regards sectoral planning, particularly in the development of the primary sectors of agriculture, fisheries and mining, priority should be given to an ecological approach that would promote knowledge of ecosystems and take their behaviour and attributes into account in the design of investment and operational projects. In addition, this approach should encompass an integrated approach to the predominant means of production, the structure of resource holding and technological models.

14. An environmental view of agricultural planning should not only associate itself with prevention of erosion and deforestation or the problem of pesticide contamination, but should also consider the degree and type of the artificialization of the ecosystems (in order not to waste environmental resources), ecosystemic specialization bearing little relationship to natural aptitude, social problems of poverty that stimulate the overuse of resources, competition in the use of land between the food, energy and industrial sectors and in relation to urban expansion, and the marked discrepancy between short-term economic conduct and the conservation of resources.

15. Environmental impact statements should be incorporated in mining-sector planning, taking the real scale of the benefits fully into account. Many mining operations with especially high ecological costs bring considerable benefits, even up to the national level. In these cases the high local cost is not so high at the national level.

16. The development planning of marine resources is generally impeded by the lack of knowledge of the behaviour of ecosystems. The incorporation of the environmental dimension in its planning processes must necessarily start with improvement of resource research systems. The planning of these resources is apt to be complicated by the existence of processes that degrade the marine environment and are difficult to control: alterations produced by residues originating on land, pollution by oil spills, and the exploitation of other natural non-renewable resources of the sea-bed.

17. As regards planning in the industrial and agroindustrial sectors, the environmental dimension appears clearly relevant to inputs as a resource demand of the primary sectors and to the generation of wastes. Faced with the great pressure on resources envisaged as an answer to the crisis, the main problem in this sector is its capacity to increase significantly the proportion of added value in the total product, both sectoral and national, and to minimize the use of resources and generation of wastes. This requires a clear awareness of the problem in the determination of scientific and technological development policies.

18. In the so-called "social sectors" (health, education, housing, basic services), emphasis is placed on their intrinsically environmental character. Their development should be integrated. Here, urban planning can offer

interesting possibilities. To start with, the big environmental problems of the metropolitan cities of the region have prompted a search for decentralization through the growing power of local and municipal administrations and offices, where the concerns of the organized local community have been incorporated to some extent. These processes are excellent ways of achieving integration.

19. The regional planning level or, in broader terms, the planned development of the territory, is where practically all the proposals on the most appropriate ways of incorporating the environmental dimension in development planning converge. It is this level which, for instance, brings out most clearly the interrelationships between towns and their surroundings and the enormous importance of planning the spatial structure and tackling the problems of land appropriation and speculation and the organization of transport systems.

20. In none of the countries of the region is regional development conceivable except in close connection with its natural resource base and its environment, in a process of exploitation and exchange that seeks to retain and reinvest in its own geographical location part of the surplus generated. In this sense, factors such as specific environmental characteristics, diversity of socioeconomic structures, community ideas with regard to resources and their problems, the complementarity of biomas, etc., play a crucial role and can only be apprehended by planning if it explicitly considers physical space. Hence the enormous importance attributed to the intra-regional planning level.

21. Finally, and in direct connection with regional planning, two very important methods are proposed for securing real advances in the incorporation of the environmental dimension. On the one hand, this means the rehabilitation of watershed planning, where the regulation of the environment is effected through the management of water; on the other hand, it means the determination of specific planning areas based on certain "relevant processes" which, with different degrees of generality and specificity, can embrace different geographical areas and sectors of the economy.

22. When using the first of these methods, special care should be taken to overcome the legal and institutional problem of the lack of coincidence of political-administrative regions with regions delimited by the area of environmental influence of the watershed in question. The second method identifies a specific environmental problem affecting not only the processes that degrade the environment but also, and in particular, those that enhance the environment through suitable and intelligent management.

23. The task is clearly difficult, in respect both of the methodologies and instruments it requires and of the political will needed for success in its performance in a context in which the crisis imposes harsh and immediate demands on the more consolidated democracies of the region and enormous

difficulties on the more recent ones. There is no doubt, however, that the stability of both depends largely on their capacity to respond in the short term without losing sight of the consequences of the most unpredictable policies on the evolution of the political, social, economic and environmental process in the medium and long term. A problem of great importance, which made itself felt throughout the discussions and which will be discussed below, was the participation of the community in the planning and environmental management of development.

B. SCIENCE AND TECHNOLOGY IN RELATION TO ENVIRONMENT

24. The adoption of foreign or imitative technological models from central countries is a notorious cause of the inadequate utilization of the environmental endowment of the countries of the region, either by waste or by degradation of environmental resources.

25. The homogenization of technological patterns has not taken into consideration the great environmental heterogeneity of the territory of Latin America and it has encouraged inefficient and harmful changes particularly in rural areas. This is especially true of the expansion of the agricultural frontier in the wet tropics, where farming methods suited to temperate areas have nearly always been used.

26. The predominant technological models have not taken into account each country's individual resource endowment and have given rise to inconsistencies, especially with regard to the scarcity of capital and abundance of manpower.

27. The need to promote technological models of high social efficiency means that these models must be reoriented towards techniques that take advantage of the natural resources and environment of each country.

28. The false contradiction between modern technologies and traditional rural pre-Colombian technologies has had negative repercussions on the upgrading of the latter and their adaptation to current development processes.

29. The alternative technological models which are advocated must be consistent with the advocated development strategies. It is therefore of real importance to examine the degree to which technological models are consistent with strategies and give due attention to heir sustainability.

30. Formal planning systems have not assigned appropriate status to the role of technology; in many plans and programmes it appears as data to be incorporated without any consideration of its instrumental roles, in particular in the transformation of the environment.

31. The deficiencies of scientific research in the region hinder the initiation and adoption of technologies that will reduce its dependence on the

central countries. On many occasions, apparently outstanding scientific developments have been achieved, in order to adopt exogenous technologies. This is particularly relevant to the adaptation, in various environments, of exogenous technologies.

C. RESEARCH ON AND EVALUATION OF NATURAL AND ENVIRONMENTAL RESOURCES

32. Notwithstanding the important advances in recent decades in research on natural resources, especially by remote sensing it must be admitted that the systems used in Latin America remain largely traditional. The main features of these systems are: priority for one or two resources, lack of a systematic focus and lack of dynamic analysis or even of comparative static analysis.

33. The introduction of research on non-traditional environmental resources has been limited in the majority of cases to simple unquantified description which, although representing an advance, have no value in the design of space-use policies. It is also usual to find qualitative descriptions of traditional resources, such as flora and fauna, with little or no quantification.

34. The traditional comparison of actual and potential use does not take into account the harmful tendencies in the resource use. The application of specific policies to attain goals derived from potential use is not successful because it disregards the constant changes in ecosystems caused by the unbalanced use of their resources.

35. The main determinants of resource use are the economic-structural factors and physical and technological constraints. It is usual, and a grave omission, to disregard historical-cultural, ethnographic, anthropological and psycho-social factors.

36. Research on natural resources usually depends on the demand for them for the production of goods or services. Financial resource constraints reduce the possibilities of carrying out exhaustive research to generate a resource supply that would bring other development options into play.

37. It is necessary to be more explicit as regards the relationship of research policies for natural and environmental resources to scientific and technological policies and specifically to models of the generation and adoption of technology. The priorities of development strategies, such as jobs and quality of life, should be directly related to research policies.

38. The manifest deterioration of Latin American ecosystems, above all the tropical forests and arid and semi-arid zones, demands more and more detailed research on these areas. This means monitoring not only physical advances but also certain determinants such as the division of rural property and the road infrastructure.

D. ENVIRONMENTAL IMPACT ASSESSMENT. COST-BENEFIT ANALYSIS AND INVENTORY AND BALANCES OF NATURAL AND CULTURAL HERITAGE

39. Environmental analysis methodologies are essential and are in great demand in the region, but it must always be remembered that they are subordinate to more strategic problems such as the determination of environmental policies, use of resources and land, protection of the national heritage, etc. The improvement and development of methodologies and instruments cannot therefore be confused with the establishment of general norms for environmental problems. Methodologies are no more than an important aid to development planning and, in particular, to the decision-making process.

40. Methodologies constitute an excellent means of enriching the available information, which is fundamental to the development of planning systems and the incorporation of environmental considerations. No matter how debatable environmental impact assessments may be, for example, by their very nature they provide organized information on effects and impacts that can be of great use. Actually, in many countries of the region EIA constitutes almost the only weapon that can be wielded in public debate in defence of the degraded or threatened environment. This is particularly true when EIA has been incorporated in legislation. Also, it is the only source of systematized information that can bear witness to the variation in environmental quality caused by an activity.

41. There is another methodological approach consisting of the various kinds of cost-benefit analysis applied to the environment. This is a very controversial topic because of the misuse of this methodology to cast doubts on environmental policy, particularly in respect of its financial requirements and its quantitative logic, which tends to assign often arbitrary numerical values to factors of the life of mankind and other species that resist this type of calculation. Similarly, it is necessary to give a different emphasis to the analysis. Although cost-benefit analysis, as it is usually applied today, contributes little to the solution of basic environmental problems, there is no doubt that the preoccupation with economic considerations in relation to the environment is just as legitimate as in relation to any other activity, owing to the chronic shortage of resources which makes it impossible to allocate society's resources without any kind of evaluation. This type of study at least brings the necessary economic dimension to the analysis. What is quite clear is that it cannot constitute the sole basis of a decision or claim an objectivity which, by nature it lacks.

42. Methodologies can make an important contribution as long as there is an effective social and political concern to develop a planning system that includes the environment. This means, above all, contributing to the solution of the major problems of our societies. The environmental issue, it has been

said, exposes fundamental issues where possible actions may have very significant effects on those major problems, far beyond the merely environmental. Accordingly, an environmental impact assessment, if well done, improves the design and construction of a project, and a cost-benefit analysis which incorporates the environment is without doubt more complex in global terms.

43. In Latin America the use of these instruments has been very limited. Numerous examples of environmental impact assessment exist but most of them are of very little use, for they are included in projects to meet the demands of financial organizations.

44. Although the majority of the countries have shown great interest in recent years in making global inventories and especially in drawing up balances of natural and cultural assets, there have been no moves to do anything about it. There are partial programmes for the inventory of traditional natural resources, such as minerals, land and water, and for the inventory of cultural assets, which are protected by the corresponding legislation. But no methodological efforts have been made to incorporate these assets in the national accounts.

45. The large volume of virgin or slightly used land in the region is an asset requiring comprehensive control. At present, only the growth obtained from the settlement of new land is calculated; there is no record of the damage and depletion of this asset caused by ecologically costly development methods.

46. The rapid growth of a development style that undervalues the cultural heritage of Latin American peoples demands a reaction to restore and revalue the region's cultural assets. Cultural heritage, inventories and programmes, together with the corresponding legislation, should constitute very useful tools in the future.

E. PUBLIC AND LEGAL INSTITUTIONS IN ENVIRONMENTAL MANAGEMENT

47. Environmental "institutionalization" has been approached in the region in a manner highly imitative of developed countries; this has only served to reinforce the fundamental way in which, in the fields of law and administrative science, a dependent juridical culture has developed.

Sectoral environment institutions, modeled on the institutions of certain central countries, have been planned from the viewpoint of "correcting" the development model and style and never of "changing" it.

48. The fact of concentrating environmental affairs almost exclusively in an *ad hoc* institution has tended, in the medium and long term, to marginalize the environmental dimension in development, for the following reasons: a) as the environment is a dimension that cuts horizontally across other sectors, an

"environmental sector" has no internal coherence and constitutes a series of disconnected problems; b) given the negative environmental tendency of the predominant development style in Latin America, the environmental sector comes to perform only a control function and often opposes the implementation of projects affecting the environment, becoming a curb on development for planners in other sectors; c) as economic and planning decisions are taken in institutions and ministries on an *ad hoc* basis sectoral environmental agencies do not have greater resources, so that the conflict is exacerbated.

49. The experience of recent years has shown that the new environmental institutions of the region, apart from publicizing the environmental theme among the people, can produce a clear and definite result only at the stage of general studies and diagnoses, especially macroregional ones, of the environmental situation in the countries and in the determination of the potential environmental impacts of certain large projects.

50. The organization of institutions in a way that incorporates the environmental dimension will depend on the concrete situation and even on the administrative traditions of each country. At the same time, it should have the following fundamental characteristics: a) a sufficient legal and regulatory base to provide the necessary support, at all levels, to the development planning system and to the incorporation of the environmental dimension; b) rigid forms of administration and centralization only in respect of environmental functions that strictly need it, but more flexible and adaptable formulas with regard to all the rest; and c) utilization of the expectations of increased democracy in the region, in order to move on from a "paternalistic" and "technocratically infallible" State to State which, both in development planning and in the incorporation of the environmental dimension, will be capable of trying out formulas that will increase popular participation in the determination of objectives and in their attainment.

51. The introduction of the environmental dimension in a given sector, such as agriculture, housing or health, has generated a strong tendency to place emphasis on environmental themes on the terms of the parent institution to which the environment agency belongs, or to dilute the holistic perspective, or to undermine credibility and acceptance when attempts have been made to influence in an effective manner the policies of other sectors of the administration and even those of the parent institution itself. It is also difficult to imagine that an agency accommodated in the health sector should lay down for the agricultural or mining sectors, for example, criteria for the management of natural resources, or vice versa.

Above all, it should be remembered that the incorporation of the environmental dimension in the planning of other sectors does not imply some kind of *ad hoc* task but rather a mechanism for collaboration or the permanent transfer of "environmental inputs", which other sectors usually see as a form of subordination that they are not prepared to accept.

52. Since the beginning of the 1980s some countries of the region have been trying to formulate national environmental systems that in some way ensure the political and functional primacy of the technical product of environmental institutions over the rest of the State, from national to municipal level, and in all pertinent sectors. The newness of these tentative efforts rules out, as yet, any judgement on their merits, although *a priori* it is right to note that in some cases the disjunction of this system from the development planning system generates some doubts as to its effectiveness.

53. If, as has been recognized, the possible and desirable fields of the incorporation of the environmental dimension in development planning are constituted by: a) global planning; b) sectoral planning; c) regional planning; d) planning of human settlements; e) watershed management; f) relevant processes; and g) specific projects derived from all the foregoing, then it is evident that any attempt to concentrate all these fields into one single institution will fail, as this would encompass practically the whole State. On the other hand, what is required is that the institutional mechanisms ensure that "environmental matters" are correctly represented there.

54. From this perspective, it seems advisable to start from a simple practical proposition: everything which, in matters of the incorporation of the environmental dimension, can and should be done within the State institutions responsible for the fields mentioned above by their own teams, should indeed be done there, and in such a way that the conformation of an "*environmental area*" is feasible only by means of analysis of the functions required for the incorporation of the environmental dimension in development planning and by means of the residual separation of those functions that cannot in any way be performed –at least exclusively– by the other State institutions.

55. Through this central specialized office the "area" is linked with the national planning system, through which it acts, in all sectors and at all levels (regional, national, etc.) without prejudice to the technical assistance agreed directly with a given institution.

56. Furthermore, adequate take-up and adequate management control, both vertical and horizontal, require the establishment of small environmental units in the different levels and sectors of the planning system, most especially in the regional planning offices and in the administration sectors whose management has an important impact on the environment (public works, agriculture, industry, etc.).

57. It is unusual for Latin American countries to have a formally established legal system for planning. The first problem of the incorporation of the environmental dimension is therefore the absence of a specific legal framework for planning, with which it can be clearly represented. Obviously, this means more than the formal institutionalization of planning, as the institutions always have legal backing; it means in fact the planning procedures or operations that the institutions themselves produce. In this

sense, regardless of the planning model adopted, all models imply a degree of mandatory force for someone, and it is indeed necessary for the incorporation of the environmental dimension to be included in the set of legally mandatory objectives and procedures. This should be so at all levels, from global planning to the environmental impact assessment of projects.

F. HORIZONTAL CO-OPERATION AND THE ENVIRONMENT

58. Horizontal co-operation is a dynamic process of the convergence of the wills and concrete actions of countries in order to overcome obstacles to economic and social development, and it must be rooted in a profound conviction of the importance, value and urgency of the subject-matter of this co-operation. This process has special relevance in environmental matters.

59. Analysis of the experience of horizontal co-operation in environmental matters in Latin America and the Caribbean shows that the region's governments have not sufficiently explored the possibilities of environmental co-operation; that governmental institutions responsible for environmental matters, in the majority of countries, are weak bodies within the public administration, although now being fully consolidated; that little knowledge and scant experience of environmental regulation is available from governmental institutions; and that many circles of political and financial power within government still do not recognize the value and the importance of the incorporation of the environmental dimension in the planning of economic and social development of engaging in horizontal co-operation.

60. In the present situation in Latin America and the Caribbean, dominated by the most profound economic and financial crisis of its whole history, these signs of stagnation in environmental matters are extremely serious. The alternatives are clear: either environmental considerations are introduced into planning as soon as possible, in the midst of the crisis, in order to ensure sustained long-term development, or things will continue by trial and error as up to now, which will lead only to the closure of the development and welfare options of future generations. Horizontal co-operation is presented as a suitable approach to the collective use of scarce resources and experience; this requires the will of the countries to carry it out, and planning and co-ordination.

61. There is not the slightest doubt that international institutions such as UNDP, ORPALC/UNEP and ECLAC should play a fundamental role in helping to put into practice mechanisms of horizontal co-operation in environmental matters. This will contribute substantially to the incorporation of the environmental dimension in planning.

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There are two reasons why ECLAC decided to accord great importance to the reciprocal relationships between development and environment. The first was that the destructive effects of development on the environment have in turn a negative repercussion on development itself; the second, that suitable consideration paid to natural resources and environment when setting up strategies, plans and development policies offers numerous opportunities of obtaining improved economic and social development and lessening the effects of the crisis. Thus, the project that brought about this book was carried through from the initial assumption that regional planning was the most favourable way to incorporate the environmental dimension into development planning. Five case studies were set up on this basis, covering ecosystems, jurisdictional area of public institutes, basin and area of influence of two major water developments. These case studies facilitated analysis of the institutional, legal and planning frameworks in which they lay. In parallel fashion, conceptual studies explored the themes of the crisis and its influence on the incorporation of the environmental dimension in planning, organization of public institutions, legal problems, environmental protection measures, assessment of environmental impact, the preparation of inventories and balance-sheets of the natural and cultural heritage and the critical bases for Latin American co-operation in the matter.

As Osvaldo Sunkel points out, in order that environmental action be feasible it is imperative that ecological considerations be taken into account where decisions are developed and adopted. This is not possible if the environmental perspective is relegated to the background, away from fundamental decision-making centres which make crucial decisions concerning the environment, and inevitably the priority ones.

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